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FOOD MANUFACTURE

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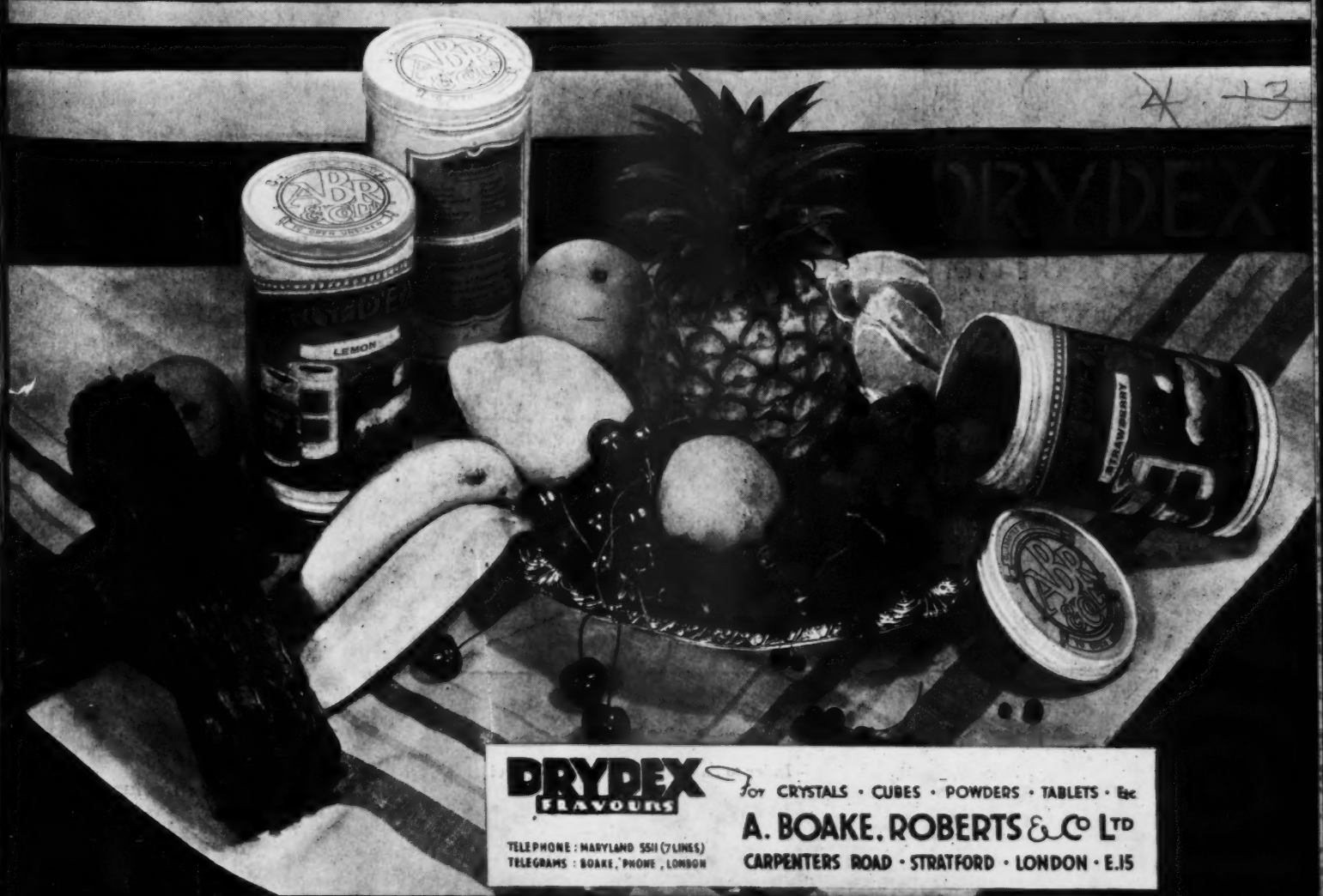

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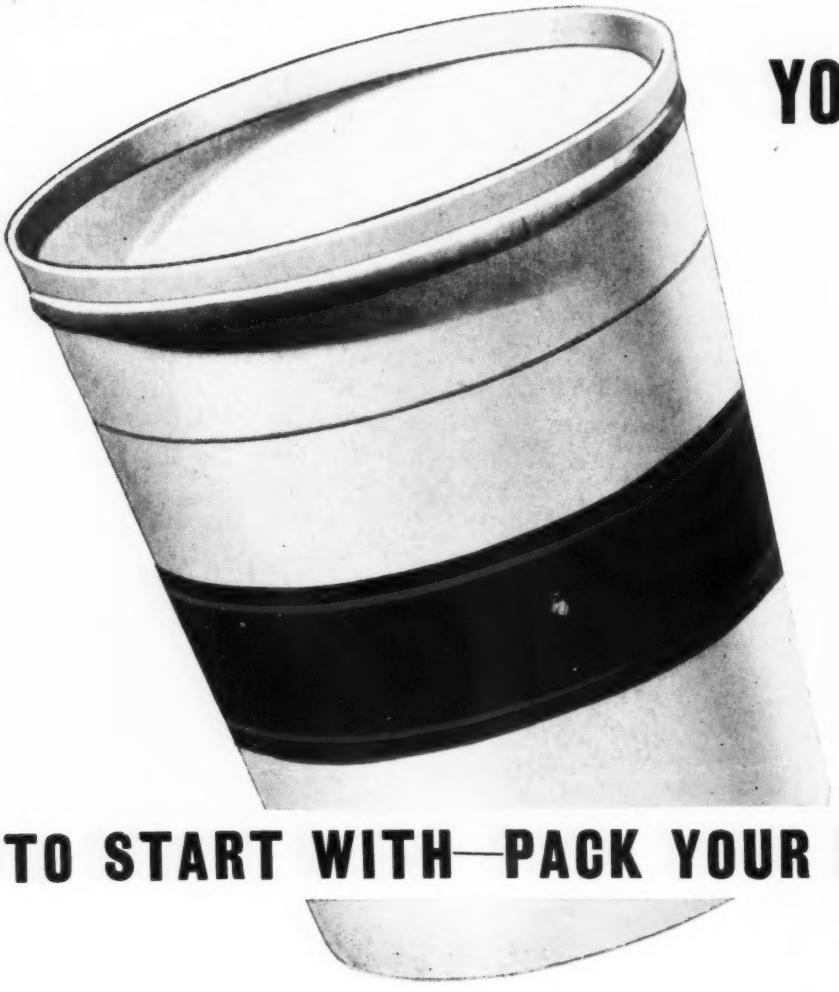

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FOOD MANUFACTURE

Incorporating Canning, Packing and Preserving.

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Special Machinery Number

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The Editor will be glad to consider contributions from those engaged in the Food Industry. Articles intended for publication should be of a practical nature and accompanied by photographs or drawings when possible.

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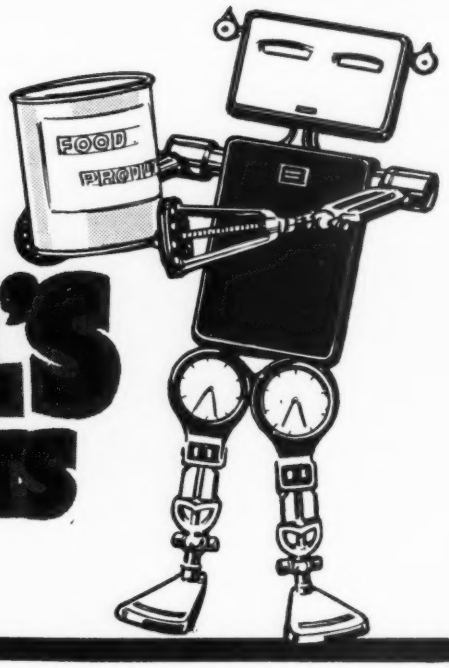

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FOOD MANUFACTURE

Vol. X, No. 12 December, 1935

Bread Consumption

ON ANOTHER page we publish a letter from Professor Drummond giving his views on the vexed question of the consumption of bread—the causes of the decline and the means, if any, which can be found for stemming this decline.

Professor Drummond has, on the whole, agreed with observations which we have previously made on this question, and, in turn, we are bound to admit the truth of the commonsense remarks contained in his letter. We also feel, as we have done from the very beginning, that it is futile to fling money about in entreating the public to "eat more bread". Apart from anything else, it does not reflect much credit on the originality of the "eat more" this, that, and the other people to fling themselves into a medley of other "publicity merchants" who are simply engaged in a childish game of bursting their lungs and blackening their faces in an effort to see who can shout the loudest.

In these days of so-called scientific publicity one naturally looks for a little more subtilty, and if there is no means of reversing the slump in bread popularity, there are, at least, several ways that readily occur to one of putting on the brake, so to speak. It is curious that the obvious ways do not appear to have occurred to these exponents of publicity. Perhaps they will try a change of tobacco! We have always been told that the way these people "get a hunch" is to stoke up, settle down, and literally smoke out the hunch from its hiding place!

Halibut Liver Oil

This reference to Professor Drummond reminds us that he and R. T. M. Haines (who, by the way, had a brilliant chemical career at Caius) read a paper on the characteristics of halibut liver oils before the Society of Public Analysts on November 6. They showed that over a wide range of oils the relationship between the iodine value and the amount of vitamin A present is a linear one. Parallel with the rise in iodine value in these oils there is a steady increase in the refractive index and the proportion of unsaponifiable matter. Moreover, in the unsaponifiable fraction the proportion of sterols precipitated by digitonin tends to fall as the proportion of vitamin in the oil increases. The values cited show that there is an inverse relationship between the amounts of sterols and of vitamin.

Scientists' Dispute

Two of our esteemed readers, Mr. F. H. Woodcock, of British Brands, Ltd., and Mr. T. H. Fairbrother, M.Sc., the cereal chemist, who is also one of our best known contributors, have been having a bout of electioneering fever, and as things stand at present they look like taking off their coats and having a real "set to"! No doubt Mr. Fairbrother's native stubbornness has been fortified by the beer and sausages which were incidental to Dr. Brabender's course in Farinography, which he has been lately attending at Duisburg on the Rhein, while Mr. Woodcock may have unconsciously assimilated some of the Welsh national spirit when he attended (and ably contributed to) the Conference of the National Food Canning Council recently held at Cardiff.

The N.M. is Pilloried

It all arose out of a note on the National Mark which we published in the October issue, in which we quoted Mr. Fairbrother's somewhat highly coloured views on the National Mark, with particular reference to the latest one for Wheat Flakes. Mr. Fairbrother condemns the specification as the "epitome of vagueness", particularly in respect of terms like "objectionable flavour", "well cleaned", "reasonably free from dust", and a "small fragment". "If", says Mr. Fairbrother, "the specification had said not less than x per cent. shall overtail a No. y sieve, we should know what it meant. As it is, it may mean anything."

A Defender of the N.M.

Now Mr. Woodcock steps forward, and after crediting Mr. Fairbrother with a certain inborn dislike of the National Mark, agrees with him that the term "objectionable flavour" is too vague, and suggests in its place the term "foreign flavour" as indicating one foreign to the foodstuff in question. "Beyond this", says Mr. Woodcock, "the alleged vagueness surely arises, in essence, from the deplorable failure of man to control the weather and certain other natural conditions under which the wheat grows and is harvested. We are progressing, and may soon be able to effect this and so specify to the nearest thousandth of an inch the three dimensions of each wheat flake. Meanwhile, the specification given is a first and not a final one."

He then goes on to refer to Mr. Fairbrother's "refreshing modesty to disclose his inability to understand the terms 'well cleaned', 'reasonably free from dust', and 'small fragments'", and as a way out of this unfortunate dilemma suggests a couple of terms at the Blackheath Elementary School.

The Retort

Of course, all this is getting rather too personal to be pleasant—but not so with Mr. Fairbrother, who loves this kind of thing, and we were therefore not surprised to receive a spirited reply from him in much the true Manchester style. As we do not care to publish these somewhat personal letters in full, but at the same time consider the points raised by the combatants are of sufficient general importance to warrant quotation, we are left with the option of merely summarising the reply which Mr. Fairbrother has made.

After admitting that he is not enamoured of the National Mark, which, he asserts, has been a failure in regard to flour, and its application to eggs has resulted in National Mark eggs being several days more stale than the old-fashioned fresh egg used to be, Mr. Fairbrother proceeds as follows:

"Your correspondent agrees with me that 'objectionable flavour' was too vague. He also says the specification is a first and not a final one, thus admitting its inadequacy. He seems surprised that I don't understand the terms 'well cleaned', 'reasonably free from dust' and 'small fragments', and I thank him for his suggestion that I should seek the meaning of these phrases from any elementary school child." But this, he says, is really not necessary in view of his years of experience in the milling business. Then continuing:

"Your correspondent hopes that soon he will be able to specify to the nearest thousandth inch the three dimensions of each wheat flake. But the millers don't ask for anything so high falutin. All they require is a definite specification to the effect that the said flakes must pass through a sieve of such and such a size and overtail one of such and such a size. Much simpler than playing with three dimensions. So simple, in fact, that the people responsible don't seem to have thought about it!"

The Residue

What does all this verbosity boil down to? Very little, in our opinion. We, ourselves, consider that the National Mark scheme is a very laudable one. It may provide jobs for certain people and that they are not exactly "soft" ones is obvious to anyone who has seen something of the inner workings of the N.M. department.

In any case, the mere fact that the carrying out of such a scheme requires the services of intelligent men can hardly be used as an argument against the Mark! Any new scheme of this character cannot possibly hope to be launched in a fully fledged and perfect condition. It must proceed to this end by a series of readjustments determined by a wise consideration of the reactions observed among the manifold interests upon which it impinges. In Mr. Fairbrother's case we have an example of a particularly violent reaction; doubtless, there will be many more—although perhaps none so dramatic! One may safely say, in fact, that the Ministry hopes and looks for these reactions for its future guidance; it would be decidedly nonplussed and disappointed if it got no adverse criticism and, on the other hand, suspicious if all the reactions were favourable. On the other hand, we agree with Mr. Fairbrother that it is difficult to see why the Ministry did not adopt the sieve experiment as the obvious means of specifying sizes. We are curious to know the reason for this.

However, the important point is that the main, general object which the N.M. has in view is a very desirable one—namely, to raise the general level in the quality of foodstuffs and to maintain it at that level. If Mr. Fairbrother has a better and nobler scheme, let us have it by all means.

Diet for Diabetics

There is probably no bodily disorder in which the diet plays a greater part than diabetes. Many different diets have been suggested for those suffering from the disease, and for the most part these have been a series of inhibitions and prohibitions

to such an extent that the life of a diabetic in the past has hardly seemed worth living. Times are changing and, with the times, ideas. These changes have been made possible by the discovery of insulin and the growing experience gained from its use on many cases. About four years ago Stolte of Breslau made the somewhat revolutionary suggestion that diabetic children should eat whatever they like. As one would expect, this was given a mixed reception. We notice, however, that in a recent paper Professor A. Lichtenstein of Stockholm has given his support to the views of Stolte. He feels that insulin has been administered too timidly, and that even to-day its use is considered secondary to strict dieting, so that the child suffers all the hardships, physical and mental, of being rationed. The new theory seems to be that from the psychological point of view it is better to let the dosage of insulin be determined by the food than *vice versa*.

A Free Diet

During the past two years Lichtenstein has allowed a score of diabetic children in his hospital and private practice to enjoy a free diet. This is free both in kind and in quantity, and the dosage of insulin is regulated in such a way that the general health is good, the gain in weight normal, and the urine is free from ketone bodies—glycosuria being permitted as long as weight increases satisfactorily. In these experiments the ages of the patients ranged from 2½ to 16 years, and most of them were admitted to the hospital so as to be under close supervision on passing from a restricted to an unrestricted diet. The transition proved remarkably easy, and it is stated that the joy of patients and parents on the removal of all restrictions had to be seen to be believed. It appears as if the encouragement has a directly beneficial effect on the course of the disease.

Automatic Rationing

At first the children showed a voracious carbohydrate hunger, but this soon passed off, leaving them with a carbohydrate consumption only slightly higher than when rationing was compulsory. Thus a seven-year-old boy who had been rationed to 110 grams of carbohydrate proceeded to demolish 300 grams a day when allowed to eat what he liked. Later, however, he spontaneously reduced this amount to about 200 grams. It is said that so far from any ill-effects being observed, the sweeping away of all dietetic restrictions is uniformly beneficial, to judge from the improved gain of weight and the comparative freedom from intercurrent infections. The main objection seems to be that the number of insulin injections had to be increased to three a day, and this is certainly a disadvantage. Still, it appears to us to be a great step forward, and it is a desirable thing that every diabetic child should be given enough food and insulin to enable him to live a normal life, feel perfectly well and develop rationally. It would seem that the potential advantages quite outweigh the disadvantages.

London's Water

There are many interesting facts to be found by those who so desire in the Twenty-ninth Annual Report of the Metropolitan Water Board. The report is doubly interesting in that it is Colonel Harold's first report as Director of Water Examination, and thus a new viewpoint is obtained. He entered office at an awkward time when, after two years' drought, it had become necessary to consider policy very carefully. In point of fact London was saved from anything more than anxiety and inconvenience owing to the huge storage systems built up in accordance with the previous policy of the Board. We may have been deprived of the usual garden supply, and had to be careful when washing the car, but there was always enough to wash ourselves and to maintain the large domestic sanitary consumption of water. Some discomfort occurred in the tidal reaches of the river when the provision of the Thames Conservancy Act of 1932, to the effect that 170 million gallons of water must pass over Teddington Weir a day, was relaxed. This resulted in sewage being carried upstream and a number of complaints were made by residents in Barking.

Chlorine or Ozone

The main interest of the present report seems to us to be the big issue of what is to be the final disinfecting agent in water purification. This is a general scientific problem that will apply everywhere—not merely in London. The drought showed up defects in the filtration system, as a result of which chlorine points have been installed in many places as an additional safeguard. Any chemical process needs time for effective action, either in contact tanks or in the mains before the draw off. The aim of successful water practice is to supply a worked out weathered water with a composition similar to that of unpolluted natural water, and chemicals are only used as a finishing process and as a corrective to counter an emergency. The choice of final process for London water rests between ozone and chlorine—or rather combinations of chlorine and ammonia, as free chlorine is no

longer used. Ozone gives an excellent finish to water and removes most disagreeable tastes, and it leaves nothing behind but oxygen. This means that water cannot be overdosed with ozone, as the gas must ultimately be dissipated. Ozone is very popular in France and acts more rapidly than does chloramine. In the report referred to, Colonel Harold sums up the situation as follows: "From the consumer's point of view, ozone presents the greater attraction, and if properly applied is an effective sterilant, provided that at all times breaches in the filter barrier can be guaranteed. On the other hand, chloramine offers an all-round security under every possible condition and is the safety first of waterworks practice."

Sausages and all that

There used to be a music-hall song which started with the lines, "When we are married we'll have sausages for tea", which indicated something a little bit out of the ordinary about this dish. On the other hand a ribald paraphrase of a well-known sentimental ballad runs as follows:

> "The sausage was a fat one,
> The outside was within,
> And the inside was a mixture
> Of a dog called 'Little Jim'."

All this goes to show that the sausage is a veritable bag of mystery. To its addicts it produces one delightful mystery after another, but to some its very mystery breeds suspicion, and it is relegated to the group of things that one simply doesn't eat. Putting aside undue adulations on the one hand and biassed criticism on the other, however, we do feel that we miss much that our German friends not only enjoy but take as a matter of course (often courses!). We English are painfully unimaginative in the matter of our food, and in general the sausage in this country only appears as the fat pork variety with mashed potato. Of course we know that at luxury shops, and in a number of delicatessen shops dotted here and there about London, sausages can be had—at a price—in great variety. To our mind, however, they have not approached the fringe even of the general popularity they deserve. In Germany we have been served with a dozen different kinds as a preliminary to a meal and very appetising most of them are.

Some Varieties

There are many varieties of sausages, from the attenuated Frankfurt to the bloated "bierwurst." They differ in flavour, colour, shape, and size. In most German restaurants one can have a choice of many sorts. There is the plain liver, good and satisfying, and the fine liver for those who are more fastidious. Some enjoy the "blutwurst" or blood sausage, others delight in the "zungewurst" or tongue type. A "schinkenwurst" is made from the best leg of pork, whereas the "bratwurst" consists of pork without bread and can be had in two varieties—coarse and fine. Two kinds that may not appeal much to the uninitiated but which taste much better than they sound—or look—are the "cervelatwurst", which is smoked sausage eaten raw, and the "lachschinken" which consists of a smoked fillet of ham enclosed in gold-beaters' skin and again eaten raw. There are some sausages such as "mettwurst", which can be spread as a paste—and, taken on schwarzbrot, or black bread, with butter, these make the most appetising sandwiches. We are informed that altogether there are over a hundred varieties of sausages scattered about the world. We wonder how many of our readers have sampled even half a dozen! There is scope for enterprising sausage makers in this country, but do let us have a variety.

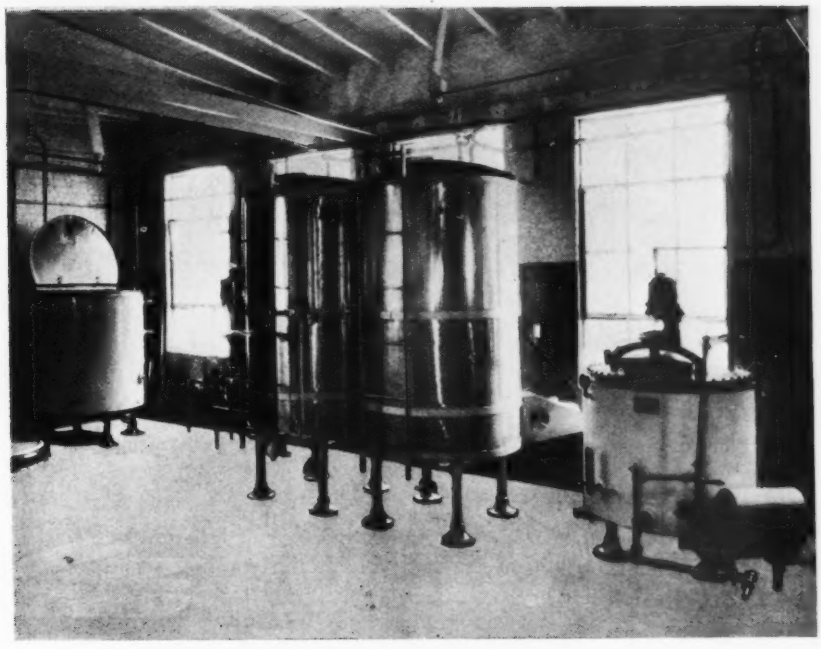
Special Machinery Number

In this special issue we are devoting several pages to articles dealing with the mechanical aspect of food manufacture and we are including a review of machinery in the form of illustrations of the latest installations and equipment. Owing to the wide range of applications covered this should prove to be of considerable value, especially to engineers and works managers who are responsible for the layout and maintenance of plant.

During the past year mechanical developments in the food industries have proceeded apace, and we have received a remarkable number of pictures of new installations that are particularly notable, as well as pictures of new and improved pieces of plant and equipment which are the result of the ingenuity of the machinery makers and their efforts in co-operation with food manufacturers. So many interesting pictures are in our possession, in fact, that we are quite unable to include them all and do justice to them in the space at our disposal in this issue. We shall therefore publish an extension of our illustrated review in next month's number, reproducing this month many of the important installations.

In addition to information describing the installations and equipment illustrated, we are also publishing items of news of extensions and developments in the field of mechanical food processing, which are of special interest to readers of FOOD MANUFACTURE.

Canning and Bottling ORANGE JUICE in CALIFORNIA



The Production Room in the Factory of the Birely Company of Hollywood, where orange juice is canned and bottled.

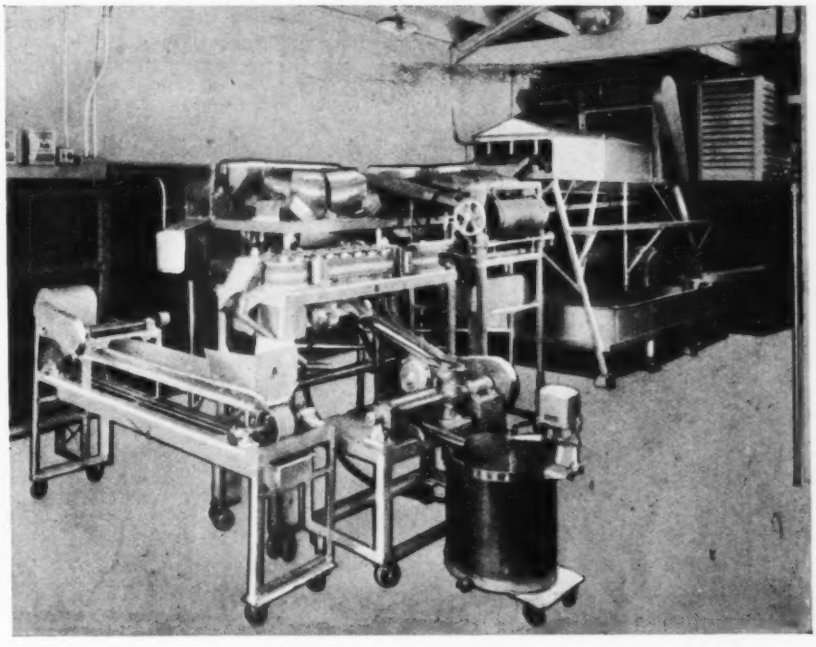
THE PRODUCTION and distribution of a semi-perishable fruit beverage which is not carbonated presents a certain number of problems not to be found in ordinary food industries. These are primarily the matter of extracting the juices, and of keeping them from fermenting without the addition of preservative or large amounts of sugar, and their distribution by a system which will ensure their reaching the consumer in good condition.

In casting around for a suitable method of handling their orangeade, the Birely Company of Hollywood naturally thought of milk, the handling of which presents problems akin to those of fresh fruit juices. They have therefore worked out a system whereby the product is distributed through dairies, after manufacture in their own plants. In this way they are assured of the product reaching the consumer in the best condition.

Naturally the quality of the oranges used has a considerable influence on the quality of the finished product, as well as on its keeping qualities. The oranges used are of the Valencia type, and only those from the middle of the picking season. The early fruit is not used as its ratio of invert sugar to natural fruit acid is not sufficiently high, while the end of the crop is too liable to fermentation and presents risks for this reason.

The fruit is bought on the trees, and taken in the company's own lorries to the plant for the making of the juice. On its arrival, the oranges are placed in soaking tanks, where the dirt and other foreign matter that may have accumulated on the surface are loosened. From the soaking tanks the fruit passes through a machine which thoroughly scrubs the surface so as to ensure its being perfectly clean.

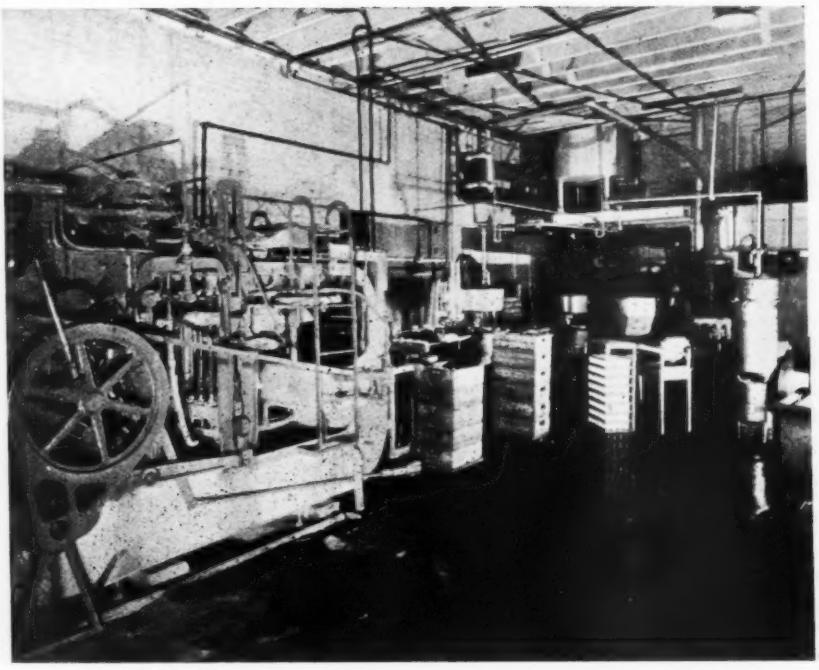
From the washer the oranges are automatically conveyed to the next step, which is that of reaming. The



The Birely Company of Hollywood—Equipment for Reaming and Washing.

reamers are of special design, and built entirely in silicate aluminium and stainless steel. They are on the same principle as the ordinary hand reamer, except, of course, they are much larger and entirely automatic. Each reamer can handle approximately one and one-third tons of oranges per hour, giving about 125 American gal. (106·7 imperial gal.) per hour.

Leaving the reamers the juice flows through stainless steel strainers, which remove the coarse pulp and the seeds. The juice is then ready to be run into storage vats. These are either glass lined or stainless steel, and are used for storing the juice and mixing it. The vats are brine chilled, and immediately reduce the temperature of the juice to a point where oxidation or change in the character of the freshly extracted juice is inhibited.



The Birely Company of Hollywood, where orange juice is canned and bottled—a view of the Bottling Department.

When a sufficient quantity of the juice has been run into the tank, it is pasteurised by a special flash process, whereby it is heated to near its boiling point within an extremely short time, and as suddenly chilled again. In order for this to be carried out successfully, the juice has to be run through the machine in film form.

Leaving the pasteurisers, the juice is filled into lacquered cans to prevent corrosion. The time required from the moment the juice is run into the machine to the moment when the same juice is in the sealed can is approximately one and one-half minutes.

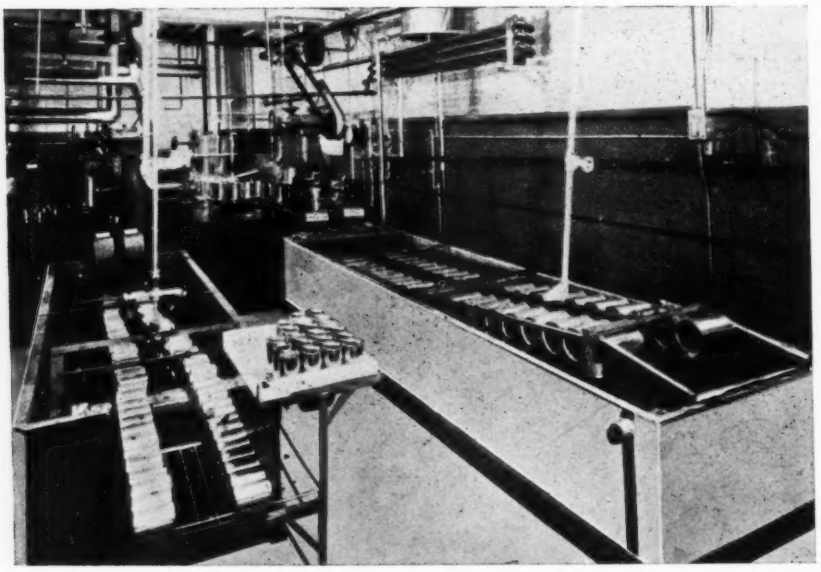
The necessity for this rapid processing of the juice is, of course, dictated by the need of retaining the original fresh fruit flavour without the addition of any sort of preservative. It is also claimed that this rapid pasteurisation does not in any way injure the vitamins, and this is borne out by actual tests which have been carried out.

After canning, the juices are again sent to a cold storage room, where they are kept until they are to be shipped.

The distribution end of the process, which is, as has been mentioned, generally carried out through dairies operating in the various local markets, consists of bottling the juice and supplying it to the retailers.

The bottles used may be either the ordinary half-pint milk bottles or a bottle of special design containing 6¾ oz. These bottles are so shaped that they will run through all the ordinary milk bottle machinery, washers as well as fillers. In this way there is no new or special machinery required by the distributor, who simply uses his milk bottling equipment to fill the juice from the large can into the small individual bottle.

The handling of the juice on the part of the distributor is analogous to that of milk. In this way the juice can be delivered fresh to the consumer to be mixed, if desired, with water or sugar, exactly as fresh orange juice.



The Canning Department in the Factory of the Birely Company of Hollywood, for the canning and bottling of orange juice.

The Principles and Practice of MEAT CANNING

By A. SAMSON, A.R.C.S., A.I.C.

Part II.

Cooking

AFTER MEATS are brined, they are transferred to the cooking departments. Before such meats are cooked it is advisable to give them a preliminary washing in cold water; this helps to remove some of the excess salt and also some of the soluble constituents in the brine which remain on the surface of the meat and produce considerable scum during cooking. This scum tends to interfere with the clean appearance of the cooked meats.

The interval between the cooking of meats and their removal from the brine should not be longer than necessary as the exposed flesh tends to darken. Again, I would advise that in transferring the meats from the brine department a metal and not a wooden truck be used. It has very often been stated that when meats are cooked by placing them first into cold water which is then heated, instead of placing them directly into boiling water, some of the flavour and nutriment is lost. My experience has not proved this. I have found no difference whatsoever when starting either with cold or with boiling water, with one exception, that there is a saving of time in commencing with hot water. I do not propose to discuss the type or the construction of the cooking vessel at this stage, other than that it should be a steam jacketed vessel.

I do not agree with the practice of heating by live steam water containing meats, for the reason that during the entry of such steam there are introduced impurities such as lime salts, boiler compounds, etc., which definitely interfere with the quality of the final products.

All scums must be removed frequently and the meats must be completely immersed during cooking. There is no need to keep the temperature of the cooking water at the violently boiling point; gentle ebullition or simmering is quite efficient.

Do not overcrowd meat into the cooking vessels as uneven cooking will result. The meats should frequently be stirred. It is better to fit lids upon cooking vessels.

The time of cooking naturally varies over a considerable range, from half an hour in the case of small tongues and small pieces of meat, to three or four hours in the case of large tongues, briskets, etc.

It is important to realise that the longer the cooking the greater the shrinkage and, after a certain point, the greater the tenderness. If special flavours or spices are to be used, a convenient time to add them is during the cooking process. Some concerns are in the habit of partially cooking their meats for a short time at the end of the day, cutting off the steam supply, and allowing the residual heat to complete the cooking during the night, the meats being removed from the cooking vessels after a short reboiling first thing next morning. This is a practice that may be dangerous, particularly in the case of the smaller cooking vessels, for the loss of heat during the night may be such as to reduce the temperature to so low a point as to allow certain thermophilic types of organisms to multiply rapidly, whereas the larger vessels, cooling off more slowly, maintain their high temperatures throughout the night and thus prevent the further growth of organisms. I do not approve of this practice as it may lead to bacteriological trouble.

The same cooking water may be used for two or three batches of meat. More than this number is undesirable as the concentration of salt, etc., may become too high and may produce undesirable flavours in the cooked meats.

If meat is allowed to cool too long in the cooking water a great deal of this water is absorbed into the tissues. This is again undesirable from the meat canners' point of view, as this absorption tends to produce wet meat, the excess moisture later playing havoc with the jelly in the final container. Absorption of water is often the cause of very weak jellies.

During cooking the flavourings known as "extractive" and other important constituents are removed, the quantity increasing with the increase of cooking time. Hence it is essential to cook for as short a time as possible consistent with the results desired.

All meats shrink when cooked, a quantity of water and fat being shed from the material. If the meat were filled raw into the containers it would shrink to such an extent and the quantity of water exuded would be so great that the finished article would present a most unsatisfactory appearance. On the other hand, if the meats were cooked for too long a period the shrinkage loss would be so great and the flavour so poor that the final results would again be most unsatisfactory. The main reasons for pre-cooking the meat are to remove some of the water and possibly fat, to produce a certain degree of tenderness, and to set up the tissues such that when the material is placed into a container it will allow itself to be moulded into the shape of the container.

From the previous statements it will be realised that, when cooking meats, the best policy is to have the individual pieces near enough the same size or weight that they can all be given the same period of cooking, thus producing as nearly uniform results as can be obtained with this class of material. Obviously it would be ridiculous to cook tongues in the same vessel, varying in weight from, say, 1 to 4 lb., and likewise it would be unsatisfactory to cook briskets weighing 6 to 8 lb. along with those weighing 10 to 12 lb. It will therefore be realised

that this pre-cooking process is a most important one, for it exerts a considerable influence over the quality of the finished article. While it does not demand the exact control of time and temperature, as is necessary with the sterilisation process, it does command a good deal of attention and control if quality articles are to be produced.

Preparing for Packing

After cooking, the meats are removed from the vessel and placed on tables. Tongues are skinned, briskets cut into shape ready for moulding, veal cut up, and sausages prepared for packing, etc. In some cases meats are packed directly into their final containers, as with tongues and sausages. In other cases the meats are first packed into moulds, as with briskets. It is useful in most cases to take advantage of the heat retained in these hot meats, and it is therefore advisable not to attempt to cool them by placing them in cold water. It is most important that the personnel realise that scrupulous cleanliness must be observed in handling these hot meats. All containers should be perfectly clean and washed before being filled. The hot meats should be handled as little as possible; use should be made of knife and fork. These precautions are intended to diminish the chances of bacterial infection.

Moulds and Containers

For moulds, those made of galvanised iron are undesirable. Those made of tinned iron are of doubtful value because of gradual de-tinning. Aluminium moulds are very useful, as are those made of stainless steel.

In packing meat and meat products into tin containers or cans I advise the use of lacquered cans. Meats and their allied products contain sulphur compounds, and during sterilisation and subsequent storage the sulphur in these compounds forms black iron sulphide with the iron in the tinplate, and sometimes with the tin it forms dark coloured tin sulphide.

The internal appearance of the can may be objectionable on removing the contents. Moreover, the contents themselves may be contaminated by these dark coloured sulphides which definitely spoil the appearance of the finished article. Hence the use of the lacquered can, and the most suitable lacquer is that known as the "sulphur-resisting lacquer".

In washing glasses before packing, if any washing powder is used, such as tribasic sodium phosphate or soda or any compound, great care must be taken to remove the last traces of these compounds by frequent changes of fresh water, otherwise the small amounts remaining on the surface of the glasses will interfere with the contents, giving rise to all manner of complications, such as affecting the flavour of the meats, bacterial spoilage, or precipitation in the jelly.

The Jelly

After meats have been packed into their moulds or final containers a solution of gelatin is generally added; the purpose of this is to bind the individual pieces of meat in each container into one whole mass, to fill up the crevices, and to give a glazed finish to the final article when it is removed from its container. Not all gelatins are suitable for this purpose.

Gelatins suitable for canning of meats are expensive and can give rise to a great deal of trouble, anxiety, and loss. Gelatin is prepared either from bones or hides. Its preparation need not be considered here. Either source will produce gelatin suitable for meat canning providing the preparation of the product is carried out with full realisation by the manufacturer of the requirements of the meat canner.

In the first place, gelatin need not be water-white, neither should it be of a dark colour; a 10 per cent. solution should be of a rather pale amber colour. It should not be cloudy or turbid, neither should a 10 per cent. solution possess any disagreeable or gluey smell.

The preservative regulations allow up to 1,000 parts per million of sulphur dioxide. In my opinion this quantity is unnecessarily excessive. I have obtained and used excellent gelatins containing no more than 500 parts per million. Too much sulphur dioxide has most unfavourable effects on the product. It helps to produce sulphide staining. It tends to be oxidised to sulphuric acid, giving rise to further complications of weakened jellies, and it can sometimes be detected in the taste by consumers with keen palates. The pH value is important and should be just on the acid side of neutrality. The gelatin should not be alkaline.

The ash of the gelatin is of great importance, as this is one of the causes of "white foots" or precipitates in glass-packed articles. A good gelatin should possess an ash content not greater than 0·5 per cent.

There is also a difference between gelatins manufactured during the winter and those manufactured during summer. With the products of some manufacturers it will be found that the summer-made gelatins are poorer. There is more sulphur dioxide present and the bacteriological count may be higher. All gelatins should be subjected to a bacteriological examination. In view of the high proportional cost of the gelatins used in meat canning, I would suggest that samples of gelatins be periodically despatched to some laboratory well acquainted with the conditions which a gelatin should satisfy when being used for meat canning.

Gelatin can be bought in either powdered or sheet form. For meat canning I prefer sheet form, as it is possible to soak and wash the sheets, removing a large percentage of the impurities present. The best method to accomplish this is to place the sheets in a large receptacle into which is run fresh cold water at a slow rate. The sheets are continually turned and the washing process is continued several hours—overnight if possible. This washing removes a considerable quantity of sulphur dioxide, any sulphuric acid formed, lime salts and other impurities, and prepares the sheets for rapid solution. A large number of bacteria, if originally present, are also removed and a very clean and satisfactory solution of gelatin can be prepared in this way. This naturally cannot be done with powdered gelatin, and so when purchasing the powdered form it is essential that it be of the highest quality and that it satisfies all the conditions for meat canning. Gelatin should not contain copper or

iron as impurities, as meat products are darkened by their presence. Gelatin solutions should not be kept at a high temperature for lengthy periods. A great deal of the gel strength is lost by prolonged heat. If gel solutions or jellies are to be kept for one or two days they must be cooled and kept cool, as gelatin is an excellent medium for the growth of bacteria. Placing jellies in refrigerators is a bad habit. Clean utensils are essential when handling gelatins.

Cooling

After having filled the moulds or containers with meats or meat products, many manufacturers set the material aside to cool overnight. This is particularly the case with large tins of tongue (6 lb.), briskets, or veal, and is quite a common English practice. This point of manufacture is a most important one. If it is intended to cool the products the natural policy is to cool as rapidly as possible. A lengthy period of cooling, particularly during summer weather, is dangerous; it may be the cause of sour jellies and spoiled meats. If the products are cooled by means of a current of cold air, care should be taken that the air is pure and clean, free from smells, bacteria, etc., otherwise there is the possibility of infecting the meats.

Vacuumising and Closing the Cans

The next operation is the sealing of the cans. There are three methods: (1) "letting in" the lid and soldering, (2) double seaming the lid without rubber compound and soldering, (3) double seaming the lid with rubber solution or compound and not soldering.

Closing machines and methods are to-day so advanced that there is really no occasion to use the first method. Method No. 2 is used with large cans, such as tongues, etc., and on the irregular shaped cans, such as D-shape and briskets; while the third method is used on smaller diameter cans and also with many of those which are sealed by the second method.

There are several good closing machines available to-day. Make sure that the seams are thoroughly made and frequently checked, particularly in the case of those rendered airtight by means of rubber compounds.

From the consumer's standpoint all sound canned foods are required to possess a vacuum. This is evidenced by the ends being "drawn in", presenting a concave appearance.

In canned meats and allied products this vacuum is produced in one of several ways:

1. By sealing the tin, heating, puncturing a hole while hot, and immediately afterwards sealing this hole with solder. This is the oldest known method and is described as "brogueing".

2. By sealing the tin, a small hole being left in the top, and applying a mechanical vacuum in a special chamber, then sealing the hole with solder while the can is still under the influence of the vacuum.

3. By subjecting the open-top can to a mechanical vacuum in a special machine, the lid being seamed on the can while still under the vacuum. This type of machine is known as the vacuum double seamer. No solder is used.

4. By filling the can hot and sealing immediately afterwards.

5. By filling the can cold, then heating the contents in what is known as an exhaust box, and on the cans emerging from the box, sealing them. This is the principle used in fruit and vegetable canning.

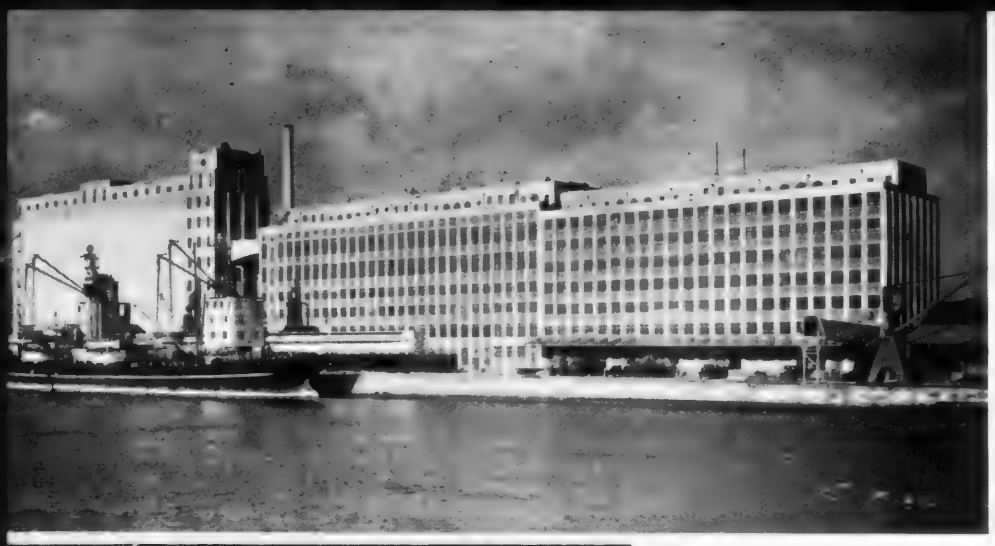
The "brogueing" method (No. 1) is out of date and very little used in meat canning concerns to-day. It is wasteful and dirty, inconsistent, and at times very troublesome. Method No. 2 is fairly widely used. The type of the machine used may be circular or square. While the method is not as rapid as No. 3, its special advantage is that it subjects the can for a fairly lengthy period to the influence of the vacuum, thus giving every chance to evacuate any entrapped air. Method No. 3 is coming more and more into fashion. The special double seaming machines are rather expensive and must be in charge of a competent mechanic. In this process the can is subjected to a vacuum for a much shorter period than in method No. 2. The disadvantage of the vacuum double seaming machines is that they will not deal with any type or size of can without a considerable change-over, an operation which consumes several hours, whereas the vacuum soldering machine in No. 2 will deal with any type or size of can, within the limits of the machine, without any delay.

The mechanically produced vacuum has a great advantage in that any required degree of vacuum can be produced in the cans without detriment to the contents.

Method No. 4 is mostly used for liquid products, such as soups, and also the smaller sizes of cans. Method No. 5 is used in special cases and may be replaced by methods 2 and 3.

The production of a vacuum in a can is useful for other reasons than demonstrating to the purchaser that the can is sound. The presence of air or oxygen in the can tends to produce discoloration and sometimes even bad flavours. The production of a high vacuum will almost always prevent such discoloration or off-flavours. Moreover, collapsing of the walls of the container by reason of the vacuum in that container, helps to press the pieces of meat tightly together, so making a firm block. This is particularly the case in tinned pressed beef or brisket. It will therefore be appreciated that the higher the vacuum the better the results. Some tins, however, will not stand high vacuum owing to collapsing of the walls of the container and consequent buckling. In this case the highest degree of vacuum is applied to the can, consistent with the strength and the fullness of the tin.

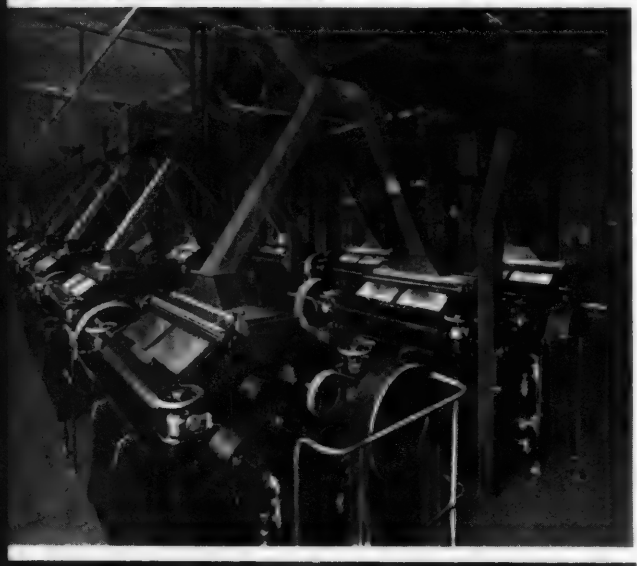
The foregoing remarks on vacuum apply mostly to tin containers. In the discussion of vacuums in glass containers I advocate the production of the vacuum mechanically as distinct from the valve action or exudation process during sterilisation. This process is most unsatisfactory. It is unreliable, dirty, uneconomic, and unsafe. In the production of vacuum by mechanical means any type of cap may be used. The vacuum is produced immediately the glass containers are filled and prior to sterilisation. In view of the rigidity of the glass container, I suggest the application of the highest possible vacuum. It will be all to the good.



MACHINERY

In this Illustrated Review of Machinery utilised in many branches of the Manufacture of Food, we are able to reproduce pictures of some of the most important installations of recent date, and of a number of examples of new and improved types of plant and equipment developed for a wide variety of operations connected with the processing of foodstuffs, from the transference of the raw materials of the industries to the ultimate packaging of the finished products.

(1)



(1) The new Spillers Flour Mill at Avonmouth, showing the Simon Pneumatic Intake Plants on the quay side at the left. For this splendid photograph we are indebted to Henry Simon, Ltd.

(2) A view of the Main Roller Floor, showing three lines of Simon 4-roll Mills at the New Spillers Flour Mill at Cardiff.

(3) Vacuum Cleaners at work in a Tea Packing Warehouse. Cleaning can be carried on whilst any operation is in progress without contamination from dust. This very fine picture has been sent in by the Sturtevant Engineering Co. Ltd.

(2)

(3) (4)

(4)This battery of Premier Mills was specially constructed for use in the preparation of St. Ivel meat and fish pastes at the works of Aplin and Barrett, Ltd., Yeovil, by whose courtesy this photograph is reproduced.

(5) Another well-designed installation. The new 2,500 gallon per hour Pasteurising Plant installed by the Aluminium Plant and Vessel Co., Ltd., for Independent Milk Supplies, Ltd., Marylebone, W.

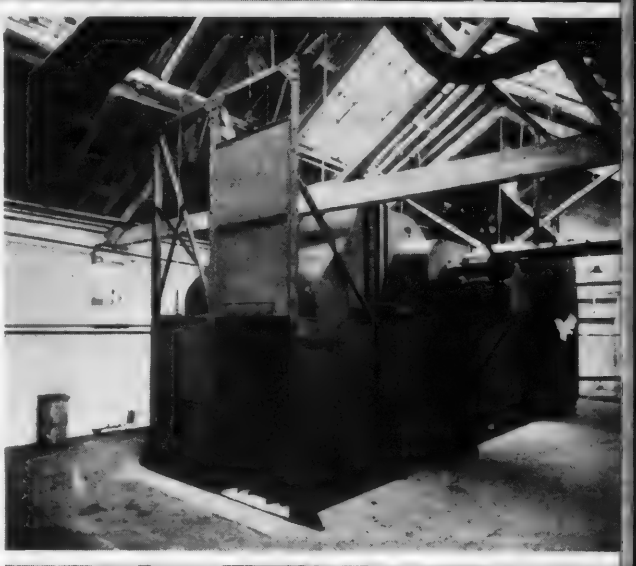
(5)

REVIEW

The illustrations have been selected from a very large number of interesting pictures submitted for consideration, as it would be impossible in the space of one issue to include all of them. The Review covers as wide a range of applications as possible and will be followed next month by a further selection of pictures. Items of news interest from Machinery Makers are published on pages 428 and 429 and the Illustrated Review is continued on pages 430 and 431.

(6) This illustration reveals a singularly fine arrangement of plant in the works of C. Shippam Ltd., of Chichester, the well-known makers of potted meats, etc. The separate electric motor drive of each machine is very compact and efficient. The Illustration has been lent by Crompton Parkinson, Ltd., whose motors are actually fitted on these machines.

(6)



(7) A Two-tunnel Dryer for Confectionery built by Musgrave and Co. Ltd.

(8) This picture shows a Cider Making Installation, in which two Cider Presses made by S. Stowe and Sons, Ltd., are included.

(9) Pfaudler Glass Lined Equipment used for processing Citrus Fruits at the works of H. W. Carter and Co., Ltd., of Bristol. The vessels, which are made by the Enamelled Metal Products Corporation (1933) Ltd., have specially designed stirrers for this work, electrically driven from the bottom.

(7)

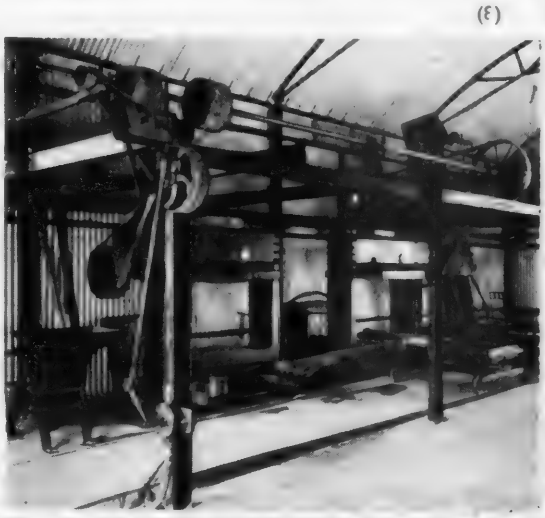
(9)

(10) The latest type of Brush Homogeniser, having a capacity of 50 gallons per hour. The makers have carried out considerable research into the characteristics of the homogeniser valve incorporated in the machine under a wide range of operating conditions, and because of its flexible nature a great variety of products can be treated.

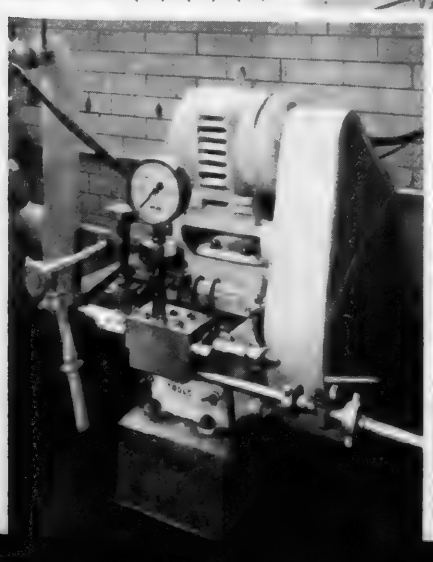
(11) A Reddrop-Periflo Grinding Mill of the Pascall Engineering Co., Ltd., in service.

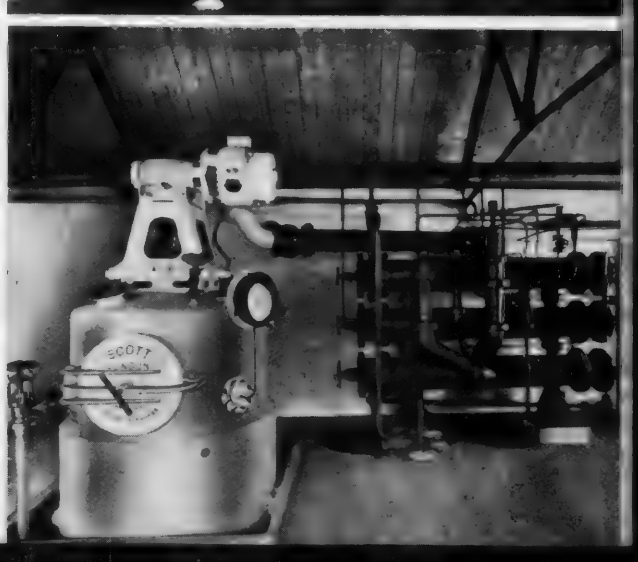
(12) This Scott Plant, which is at Riley's Dairies at Hull, is utilised for Vacuum Cooling of Condensed Milk, cooling being effected simply by lowering the pressure. The vessel on the left is enamel-lined and fitted with Scott's Special Geared Stirrer Drive.

(8)



Bottom Row: (10), (11), (12)





MACHINERY

Vacuum Cleaning Food Factories

It is interesting to hear that Turbine Vacuum Cleaners (No. 4 and No. 5) are popular in food product factories, so the Sturtevant Engineering Co. inform us. These machines were designed to meet the demand for machines adaptable for general vacuum cleaning work, and to be of sufficiently robust construction for use in mills, workshops, and factories. They have been successfully applied to almost every kind of duty and can be used by unskilled operators without liability to damage.

Among the many well-known firms using these machines are Allen and Hanburys, Ltd., Cadbury Bros., Ltd., J. and J. Colman, Ltd., Express Dairy Co., Ltd., Huntley and Palmer, Ltd., and Tate and Lyle, Ltd.

Paste Mill Modifications

Premier Colloid Mills, Ltd., have devised a modification of the existing Paste Mill whereby the working surfaces are serrated so that materials such as the normal waste products from soup manufacture are gravity fed and a shredding action is obtained on the product, enabling this to be used in normal work.

For really viscous pastes, where a large output is required, they have devised a special type of Pug Pump, fitted with a self-contained motor, which enables a gentle pressure of the material to be maintained on the rotor of the machine, thereby ensuring a constant steady output, greatly increased over the normal output obtained by a gravity feed.

High Speed Machinery

Improvements in packing machinery developed by Southall and Smith, Ltd., include a flour weighing machine which will weigh and fill at a speed up to 18 per minute, the bags being finished off by hand.

Another machine of interest is their new "Forward Head" High Speed Measuring Machine for filling at even greater speeds than before all kinds of powders from a few grains up to 2 oz. or more. It will fill loosely, or compress material into containers as desired, the measured quantity being extremely accurate.

Power and Steam Plant

Marshall Sons and Co., of Gainsborough, are well known to be closely associated with the food manufacturing industry in the supply of power and steam plant, and during the current year they have been responsible for the provision of motive plant in connection with numerous dairies, bakeries, restaurants, hotels, sugar mills, bacon factories, biscuit works, canning factories, and other associated industries. This firm has recently been acquired by Thos. W. Ward, Ltd.

Pumps for all Foodstuff Purposes

We notice that the Albany Engineering Co., Ltd., make an extensive variety of pumps which should satisfy the needs of all food manufacturers. There are belt-driven pumps for handling syrups and brines; electrically driven pumps provided with special brushes for foodstuffs without self-lubricating properties; pumps with their bearings outside so that the materials handled are uncontaminated by lubrication; pumps for jam and marmalade, which can be handled at pressures up to 60 lb. per square inch without injuring the material; steam-jacketed pumps used for foodstuffs which have to be solidified or kept hot during transfer. There are other varieties which we have not the space to mention here, but a further point worth remembering is that all the pumps can be employed for filling and discharging tank-wagons used for carrying edible products and may be fitted on the tank-wagon chassis.

South African Deal

Particulars have been sent to us of an important and interesting order received by J. and E. Hall, Ltd., of Dartford, Kent, from the South African Railways and Harbours, for refrigerating plant to be used in the South African fruit trade. The aggregate horse-power of the motors for driving the compressors for equipment to be installed at Cape Town will amount to nearly 2,500 b.h.p. and at Port Elizabeth to 1,700 b.h.p.

This firm are now completing an installation in East London, and the motors used for driving the compressors have an aggregate of 520 h.p.

The important part played by this country in the supply of refrigeration equipment can be gauged from the figures quoted here, and it is a direct result of the recent and remarkable developments in the fruit export trade from South Africa to this and other countries.

Big Orders

We learn that the Manesty No. 3 table machine of Manesty Machines, Ltd., is being used very largely in the manufacture of lemonade and other cubes for making beverages, one firm alone having bought 75 of these machines to be able to cope with their immense output.

Economical Destruction of Refuse

News has been received that a large incinerator with multiple steam boiler is now being installed by Meldrums, Ltd., at Huntley and Palmer's well-known factory at Reading.

Meldrums, Ltd., Timperley, have many designs of plant for the destroying of waste materials, from small ones burning 5 lb. an hour up to municipal destructors burning several tons an hour. Frequently the heat of combustion of the refuse is utilised for processes requiring heat, as is the case with the incinerator installed by this firm at Crawford's Biscuit Works, Liverpool. The material destroyed is mainly paper scraped from old tins.

Other incinerators of interest to the food industry are the Heenan steel-cased incinerators of Heenan and Froude, Ltd., who, in particular, supply a special model for the destruction of fish offal, which with reasonable care on the part of the fireman will diffuse no odour during the process of burning.

New Mixers

Details have been sent to us of new machines produced during the present year by the Morton Machine Company, of Wishaw, Scotland. Perhaps the most outstanding is the patent Mixer/Emulsifier, which, as its name implies, is a combined mixing and emulsifying machine. Insoluble materials such as mustard and pepper can be handled without clogging.

There is also an entirely new mixer called the "Grindlap," which is particularly suitable for very soft doughs of the gingerbread class and for all kinds of high-class butter work. This machine can also fold fruit into the cakes without bruising or damage.

Temperature Pressure Controller

Short and Mason, Ltd., have sent us details of an equipment at the works of Messrs. J. and S. Alexander, Ltd., who are the proprietors of A. Harvey, which has recently been duplicated, for the automatic temperature and balanced pressure control of retorts used in the processing of tongues in glass containers, the instrument effecting this control being their new Time Schedule Temperature Pressure Controller.

We hear that Messrs. Alexander, Ltd., are planning the installation of this equipment on all their other retorts.

MAKERS' NEWS

Metal Flooring

The confidence now being placed in "Stelcon" Steel Flooring, such as is supplied by Langley (London), Ltd., is shown by the fact that 30,000,000 square feet of this type of flooring is now in daily use in a wide range of industries in various quarters of the globe. Cast Iron flooring by Iron Paving, Ltd., is also making strides in food factories.

As such flooring does not disintegrate, it is dustless and easy to keep clean—both important points in the manufacture and handling of food.

Non-Stop Labelling

The "LL" machine supplied by Labellers Unlimited, to Messrs. J. C. Rawlings (Coffee), Ltd., of Bristol, is kept running day and night labelling coffee bottles.

Among the many other firms using the machines of Labellers Unlimited, are Allen and Hanburys, Ltd., of Ware, Herts, where they are used for labelling the recessed lids of tins of food.

Vacuum Seamers

We have recently received from Ashworth and Parker, Ltd., of Bury, a copy of their latest leaflet dealing with their vacuum sealing machines. The "Chorlton" machine has been developed by this company from first principles with a view to providing a reliable article which would be economical in power and vacuum and could be easily and quickly capable of being set up for different sizes of can. Many of the ingenious devices used for these purposes have been patented both in this country and abroad.

Three types are supplied: (*a*) For hand feeding with the seaming head only driven by power; (*b*) for hand feeding with all the motions power driven; (*c*) automatic feed and power driven throughout.

Crofts (Engineers) Ltd.

The whole of the power transmitting machinery for the two mills of J. Rank, Ltd., Southampton, and the Associated London Flour Millers, Victoria Docks, was supplied and installed by Crofts (Engineers), Ltd., of Bradford. Electric power is being extensively used nowadays for drives in food manufacturing and processing plant and independently driven machines are often installed.

Kellie Development

An important machine is announced by Robert Kellie and Son, Ltd., of Dundee. It is the latest Kellie Patented Multiple Diverging Wire Type Fruit and Vegetable Grading Machine, which is constructed to grade fruits without damaging.

Another machine from this firm, perhaps of equal importance, is the Kellie Continuous Spray Cooler, Automatic Process for Horizontal Retorts, in which the cooling of cans after processing can be effectively carried out in bulk without unloading the cages.

"Rapid" Machine

Large numbers of the combined Patent "Rapid" Sifting and Mixing Machine with Sprayer have been supplied by Wm. Gardner and Sons (Gloucester), Ltd., for jelly crystals, powders, etc. The internal parts of the machine are nickel plated and highly polished, and also covered with acid-resisting enamel.

Aluminium Plant

Recent manufactures by Fredk. Braby and Co., Ltd., in aluminium ware include storage tanks for fruit jellies; trays for gelatine and chocolate; vacuum tanks for condensed milk; storage tanks for natural milk; trolleys, syrup tanks, and steam-jacketed boiling pans for canned vegetable products, and carrying pans for jam.

Chambon News

Chambon, Ltd., have sent us their No. 4 *Chambon News*, which has just been issued. This contains excellent illustrations in photogravure of their machines, works, and installations, and includes an artistic colour print from the Chambon multi-colour photogravure machine which works at the rate of 7,000 impressions per hour.

"Neverstop" Packaging

The "Neverstop" Package Machine of Stokes and Smith Co., with automatic feed, operates up to 120 packages a minute; with hand-feeding a speed of 90 a minute has been reached in certain cases.

Quaker Oats, Ltd., are among the firms using the Package Wrapping Machine (Model 106) of this firm.

A New Lamson Speciality

We have recently been informed that the Lamson Pneumatic Tube Co. have a department specialising in ventilation and air conditioning, apart from their well-known activities in vacuum cleaning and pneumatic tube conveying plant as applied to factories. The Lamson Store Service Co., Ltd., of the same address deals with all types of conveyors for factories, offices, shops, etc. All the equipment with the exception of electric motors is manufactured entirely by them in their recently modernised factory at Hythe Road, Willesden, and they are also equipped for the carrying out of complete installations.

Both the Lamson Pneumatic Tube Co. and the Lamson Store Service Co. issue attractive catalogues dealing with all departments of their services. It is very interesting to note that these Companies were founded as far back as 1888.

Electrical Distance Thermometers for the Cunard White Star Liner "Queen Mary"

Elliott Brothers (London), Ltd., have recently supplied a combined Temperature Indicator and Selector Switch, together with twenty distance thermometers for measuring the temperature at various points in the provision stores of the *Queen Mary*.

New C.W.S. Dairy

The latest plant installed by L.C. Engineering Supplies, Ltd., is that of two Fully Automatic Retorts at the new C.W.S. dairy at Cricklade. One retort is for sterilising canned cream and the other for sterilising canned evaporated milk.

Singapore Order

The Liverpool Refrigeration Co., Ltd., have received an order for a single-cylinder "Polar" Sleeve Valve Compressor and Air-Cooled Condenser for shipment to Singapore.

New Refrigeration Installation

One of the new model Pilot Enclosed Ammonia Compressors made by Randalls Refrigeration, Ltd., has been installed in the chocolate room of Thomas Parkinsons, biscuit manufacturers of Preston.

Dairy Show Success

The "Brush" Homogeniser supplied to Hammett's Dairies, of Exeter, was instrumental in winning for them the British Dairy Farmers' Association Challenge Cup, Silver Medal and first prize for cream samples, including two of low butter content, at the Dairy Show this year.

MACHINERY REVIEW

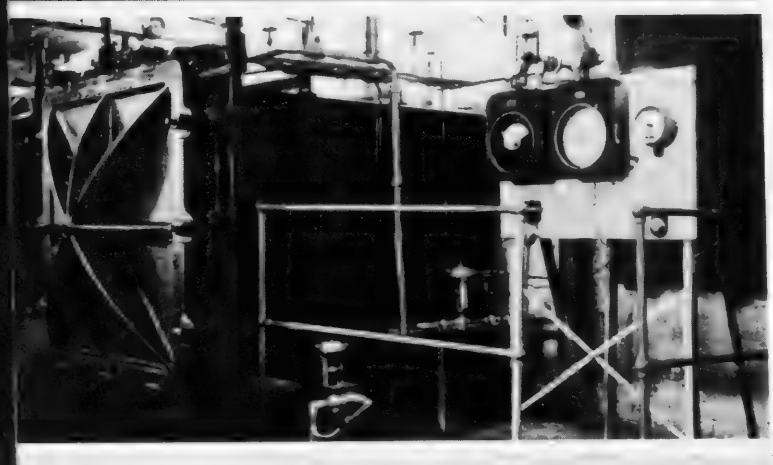
(*Continued from pages* 428 *and* 429).

(13) A B.T.H. Photo-Electric Counter is fitted on this machine at Jacobs' biscuit factory at Liverpool. This instrument incorporates a photo-electric cell by which light energy is utilised to actuate an electric instrument, such as a relay, for the operation of controlling devices.

(14) Retorts used in the processing of tongues in glass containers at the works of J. and S. Alexander, Ltd. (proprietors of A. Harvey), with Automatic Temperature and Balanced Pressure Control apparatus fitted by Short and Mason, Ltd. The instrument effecting this control is their new Time Schedule Temperature Pressure Controller.

(15) This photograph of a Continuous Rotary Drier for powders has been sent by L. A. Mitchell, Ltd.

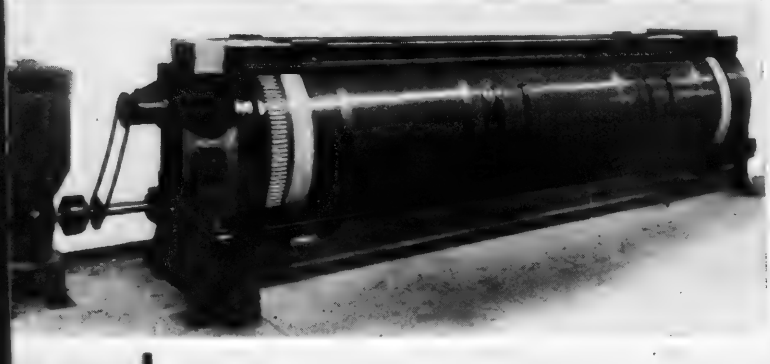
(13)



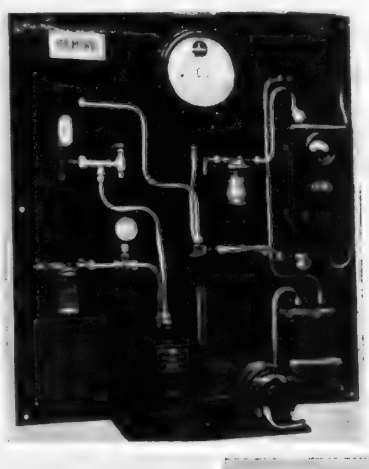
(16) A complete equipment for measuring the percentage of CO_2 in food stores. The store gas is drawn by a motor-driven pump through a "water-trap" (a large cotton wool filter), thence through the Draught Gauge (bottom centre), the CO_2 Transmitter (top right-hand), and the Gas Flow Indicator to a vent. The percentage of CO_2 is indicated on the dial scale. (By Elliott Bros., Ltd.)

(17) A further addition to the range of Pilot Enclosed Ammonia Compressors made by Randalls Refrigeration Ltd. The new model has a capacity of 3 tons refrigeration under standard conditions. It is electrically driven by a 7 h.p. motor and has a multi-tubular condenser. Where required an automatic control panel with safety features can be fitted.

(14)



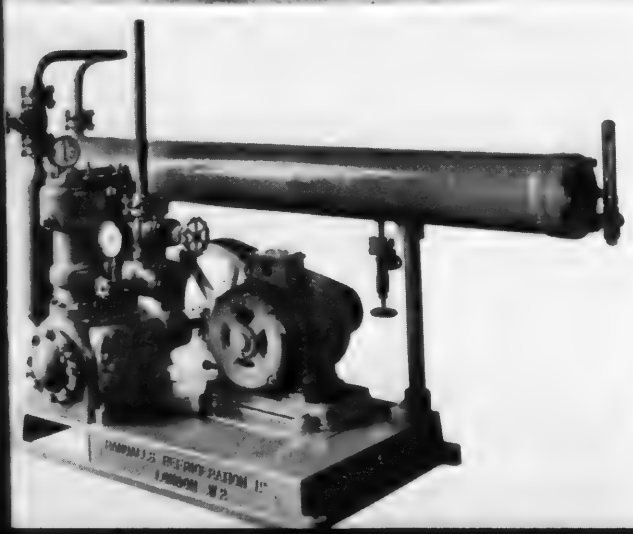
(15) (16)

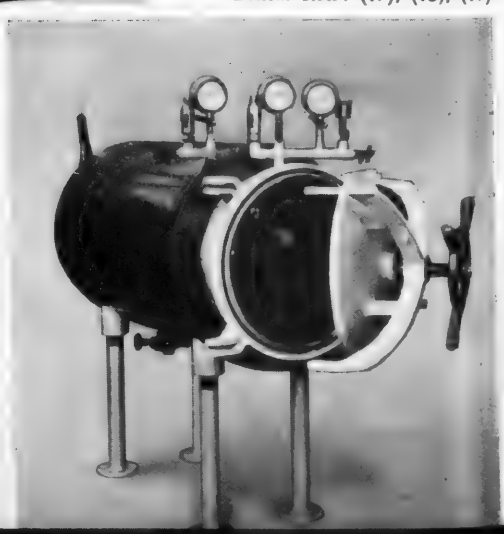


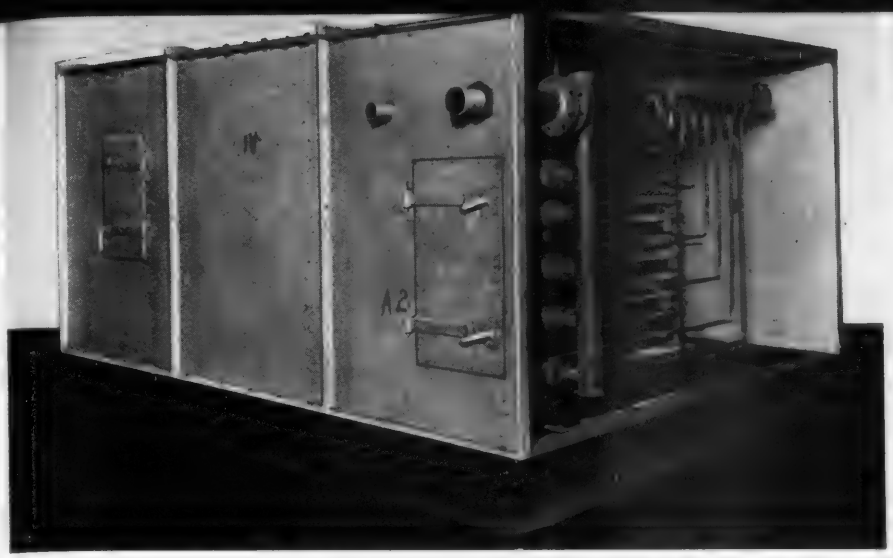
(18) A Frozen Egg De-frosting Machine. The purpose of this machine is to break up partially de-frosted frozen egg. Thorough mixing and amalgamation of the egg is ensured and de-freezing of a 50-gallon batch takes approximately 1-1½ hours. Two models of this machine, which is by the Morton Machine Co., of Wishaw, are available in 25 and 50 gallon capacities.

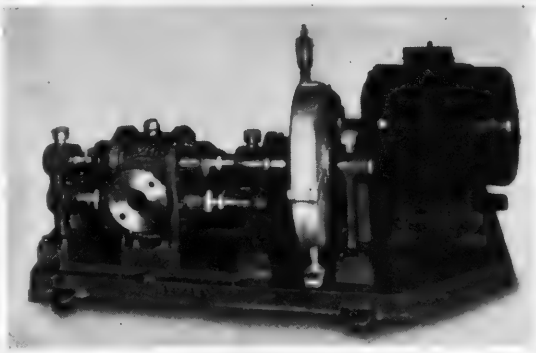
(19) A small steriliser made by John Thompson (Dudley) Ltd.

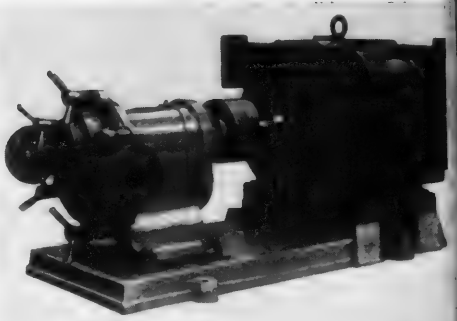
Bottom Row: (17), (18), (19)











Top Row: (20), (21) *Bottom Row:* (22), (23), (24)

(20) This illustration of an Air Cooler of the wet type, partly erected, shows some of the cooling coils and the pipes conveying the brine to the spray jets. (With acknowledgments to J. and E. Hall, Ltd.)

(21) This illustration shows the latest Kellie multiple diverging wire type fruit and Vegetable Grading Machine. It is constructed to grade without damaging fruit such as gooseberries, plums, damsons, cherries and tomatoes, and vegetables such as potatoes, sprouts, carrots and asparagus, the latter two being graded for the thickness or diameter only. The machine is built in two sizes, one ton and 1½ tons per hour capacity, the one illustrated being the larger size. By courtesy of Robert Kellie and Son, Limited.

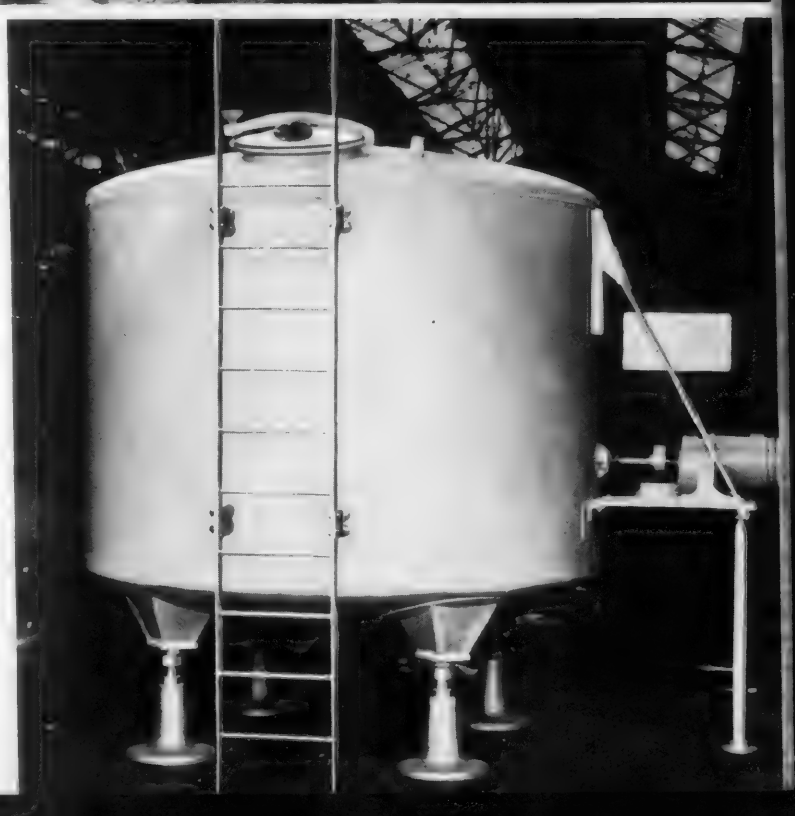
(22) A motor-driven example of a pump used for the transference of all kinds of foodstuffs. In this type the bearings are outside the pump so that the material being handled cannot be contaminated by lubrication. By courtesy of the Albany Engineering Co., Ltd.

(23) The horizontal "Nuflo" pump designed by Worthington Simpson, Ltd. It is compact and simple in design and suitable for use where a centrifugal pump is ineffective or a reciprocating unit expensive. The "Nuflo" pump will handle viscous liquids and is claimed to be practically noiseless in operation. Excessive wear of moving parts has been reduced to a minimum, thus greatly extending the life of such a pump.

(24) A special design of Howard Rotary Pump utilised for foodstuffs, the end-cover and rotors of which can be readily removed for cleaning. Owing to the special design of this pump, wearing surfaces are reduced to a minimum, there being no metal-to-metal contact in the pump chamber. The pump is self-controlling and has no churning action on liquids. For foodstuffs this pump s made in stainless steel.

(25)

(25) An example of metal flooring. In this case the "Stelcon" Anchor Steel Plates have been fitted where conditions are particularly wet. The picture shows the bottling room at the Brewery of E. Lacon and Co., Ltd., at Great Yarmouth.



(26)

(26) This large tank of 1,600 gallons capacity is of welded construction in stainless steel and has the inside surface polished to keep it in perfect condition. It is provided with motor-driven side-stirring equipment and, being a closed vessel, is fitted with a man-hole and sight-glass. Construction by Metal Propellers, Ltd.

A further selection of pictures of installations, plant and equipment will appear in the January issue of "Food Manufacture."

THE FOOD GROUP

THE opening meeting in the new session of the Society of Chemical Industry's Food Group took place recently at the London School of Hygiene and Tropical Medicine (October 16, 1935). Five principal papers were read during the evening, the wide variety of these in itself being some indication of the enormous scope of the Group's activities.

The first paper was read by Mr. A. LL. Matthison, and dealt with "The Use and Purpose of Lacquer for Food Containers and Closures". This was an interesting survey of the important subject of lacquer, the processes involved in its application, and the various types of food container. It will be published shortly, together with the other papers, by the Society of Chemical Industry.

In speaking on "Present-day Milk Problems", Mr. Ben Davies referred to the "Accredited" scheme of milk production. Mr. Davies suggested that it involved no single requirement which should not appertain to milk production everywhere. Indeed, he said, the very adoption of the scheme was an acknowledgment of defects in the great bulk of our supplies. The essentials of good milk production, said the speaker later, were simple yet indispensable. They were to milk, with clean hands, from a clean udder, into a clean vessel, and to ensure that every piece of equipment—coolers, churns, milking machines, etc.—with which the milk came in contact were cleansed and sterilised each time after use.

"The responsibility of the bacterial content of a sample of pasteurised milk is placed on the pasteuriser," added Mr. Davies. "It really rests on the quality of the original milk. If this was produced with regard for simple precautions already mentioned the quality of pasteurised milk in any efficient plant would justify a vastly more exacting standard than now obtains. Our main problem remains what it always has been—a need for better milk, and a more discriminating standard whereby to judge it." To ensure an assuredly healthful milk supply there was no alternative to pasteurisation.

In urging the need for better plant, Mr. Davies said the efficiency of our methods, of our machinery, and of our equipment depended on the information yielded by bacteriological technique. "I am sure that until the hygienic quality of all milk is raised to the level I have tried to suggest", he added, "that bacteria plate counts made on ordinary standard agar afford a sufficiently exacting standard. But for efficiency control of methods and equipment, the information gained from cultures on such media is misleading and inadequate. The adoption of a milk-agar media, which gives a much increased colony count, has revealed conditions which were hardly suspected when reliance was placed on ordinary agar plate counts."

In conclusion, Mr. Davies suggested that consideration should be given to the possibility of permitting systems other than the exclusive officially authorised method of pasteurisation. "Although I was perhaps the pioneer of this method in Great Britain", he remarked, "I question whether the time has not come to permit the adoption of other systems. That methods of heating milk to a temperature of 160° F. for 15 seconds give complete protection against tubercle permits, I think, of no doubt. Research conducted under the supervision of the scientific staff of my company, and extended over a prolonged period, left no doubt of this, and this experience is confirmed by every official or Government test in the United States with which I am acquainted. There appears to be a consensus of scientific opinion that a bactericidal efficiency which eliminates tubercle affords protection against other pathogenic organisms with which we may have to contend in milk. As the matter stands we appear to be bound to the existing system because no provision exists for officially testing alternative methods. With modern resources for controlling temperatures to fractional degrees, and preventing the discharge of under-heated milk, there would seem to be no reason for longer delaying the adoption and licensing of alternative systems to the holding method, which is not free from difficulties and objections. The absence of any possibility of oxidation effects on vitamins, the elimination of foam, the avoidance of thermophilic bacteria in the plant and in the pasteurised milk, the immense simplification of the equipment and of its cleansing and sterilisation are advantages from which the industry is debarred pending some action by the Ministry of Health."

Dr. H. E. Cox next presented a short paper entitled, "Notes on the Composition of Meat Extracts and Meat Cubes". Dr. Cox said the composition of meat extracts as as present marketed showed evidence of changes which had taken place during recent years. There had been a diminution in the proportions of creatine and creatinine, which were the most important meat bases present. Years ago figures for creatine and creatinine would average 10 per cent., whereas they now average about 7 to 8 per cent. There had been a diminution in the proportion of meat fibrin and some increase in albumoses and peptones in lower grade extracts. The speaker then discussed reasons for these changes. The figures of Bigelow and Cook (1906), which were widely quoted in current text-books, were not quite representative, he said, because it appeared that the extracts must have been prepared largely from non-muscle tissue.

"The Purification of Water for Drinking" was the title of the address by Mr. A. H. Waddington, which was next read. Mr. Waddington explained how the increasing demand for pure water, coupled with a decreasing number of sources of unpolluted water, had led to a very rapid advance in the methods of water purification. After giving some account of the history of this development, the speaker gave an interesting description of modern purification practice, and dealt with the processes involved in the treatment of water in a variety of situations. In references to sterilisation, Mr. Waddington mentioned ozone, which, he said, after a long period of infrequent use, was rapidly returning to favour owing to the marked advances in efficient production, and the increasing availability of cheap electricity. Ozonisation of the filtered water, he went on, not only destroyed all bacterial life, but, due to its breakdown into oxygen, it aerated the water, yielding a bright sparkling product of improved colour and low oxygen absorbed value. For drinking water supplies ozone had an advantage that overdosage did no harm, as it could not impart either taste or odour to the treated water. In his closing remarks Mr. Waddington said that to-day physical and bacteriological characteristics of all chemically treated waters were the factors most closely watched. The reasons for this modification of opinion were that perfectly pure and wholesome waters might contain ammonia, nitrites, and nitrates, either derived from geological sources, or from the chemical treatment, while even if derived from sewage contamination the water, after correct treatment, could be regarded as a safe water for drinking. Appearance, *p*H value, and bacillus coli content were to-day considered the most important data in judging the suitability of a water for public supply.

The final paper of the evening, read by Mr. P. Bilham, was a joint contribution with Dr. Lampitt, under the title "Notes of the Absorption Spectra of Honey". Mr. Bilham explained that the absorption spectrum of honey has been already studied by Schon and Abilgaard, who proved that the addition of invert sugar, prepared by acid hydrolysis, could be detected by the appearance of an absorption band with a head at 2825 A, due to hydroxy-methyl furfural. This substance was formed on inverting sucrose with acid or heating fructose with acid. It followed, therefore, went on Mr. Bilham, that it might be formed when genuine honey was heated during factory operations, and that such honey when tested might be suspected of adulteration. The work reported, although incomplete, demonstrated that while such honey would give a positive result with the Fiehe test for hydroxy-methyl furfural, it did not show the absorption band. On the other hand, as little as 2 per cent. of added invert sugar, prepared by acid hydrolysis, in genuine honey could be detected. Mr. Bilham suggested that the Fiehe test was too delicate and that only strongly positive results should be taken as evidence of adulteration. The absorption spectrum appeared to be a better criterion but needed more study before adoption as a criterion of purity. Neither the Fiehe test nor the absorption spectrum could detect invert sugar prepared by enzyme action.

The Conference on
The NUTRITIVE VALUE of CANNED FOODS

WE PUBLISH here a report of the Conference on the Nutritive Value of Canned Foods which was held on October 30 in connection with the Annual Convention of the National Food Canning Council at Cardiff. The Conference was opened by Dr. H. B. Cronshaw, Editor of FOOD MANUFACTURE, who was followed by Miss Olliver, of Messrs. Chivers, Dr. H. Cheftel, of Paris, and Mr. F. Hirst, Director of the Campden Research Station.

The Nutritive Value of Canned Foods

By H. B. Cronshaw, B.A., Ph.D., A.I.C.

Mr. A. Llewellyn Matthison, President of the National Food Canning Council, Chairman of Conference.

Those of us who are associated with the production of canned foods, and who are therefore fully aware of the true facts concerning their safety and wholesomeness, are apt to forget that others are less fortunate in this respect. This is quite understandable. One has only to cast one's mind back over half a century to be reminded of the extraordinary progress made in the methods of canning under the influence of science, so that what was once a rather crude art has now become a highly scientific industry, subject to the most rigorous control by chemists, research stations, Government officials, and medical scientists. Little wonder, then, that many of the notions one finds lingering in the minds of people are quite out of date and utterly fallacious.

Of course, there was a time in the early days of canning when the imperfections of production methods were reflected in the quality of the goods turned out, but with the growth of experience and scientific study, these imperfections have been gradually overcome, until now it may be said that of all foods which reach the consumer's table canned foods are among the cleanest, the safest, and also the most palatable and nutritious.

When one recollects that canned foods are simply fresh foods carefully selected and cleaned, and then immediately sealed and sterilised in perfectly clean containers from which even the air has been removed, so that they are protected from all possibility of harm by contamination, it is not surprising to find that the canned foods of to-day are actually superior in point of nutritive value, quality, and safety to health to corresponding foods cooked in the ordinary way.

Nevertheless, the fact remains that long-standing prejudices are difficult to remove, so that even to-day there are many people who have failed to correct their old-fashioned ideas, and who still harbour a suspicion that in some mysterious way canned foods have not the same virtues as fresh foods. Nothing could be further from the truth, as has been abundantly proved by many tests and researches carried out by scientists in almost every civilised country in the world. Accordingly, an occasion such as this is to be welcomed in affording an opportunity of making more widely known the true facts relating to the nutritive value of canned foods.

As regards our own canning industry, which is a comparatively new one to this country, we have had the advantage of starting with all the knowledge accumulated by the Americans, and to this we have added the results of our own intensive researches, with the happy result that the great majority of British factories are of the very latest design, and the operations in them are conducted in accordance with the exacting requirements laid down by the leading specialists of two continents under the watchful eye of the public health authorities.

No one would be more surprised than the ordinary housewife were she to visit one of our canning factories and see the extraordinary care taken to ensure the packing of products of the highest quality under scrupulously clean conditions, and to compare these conditions with those under which she prepares food in her own kitchen. What would astonish her more than anything else is the manner in which tons of fruit, vegetables, and so forth pass in a practically unbroken stream from the fields into the cans without being touched by hand, and the care taken to discard all material which does not come up to certain rigorous standards of quality and cleanliness.

The Development of Canning

The canning of foods has developed in a perfectly natural way in response to the changing habits of the people, until now it has come to serve an essential purpose in the life of the community, providing millions throughout the year, regardless of the seasons, with a rich variety of foods gathered from every corner of the globe.

Scarcely less striking is the change which has come over our attitude towards questions of diet and nutrition in general. There was a time when it was firmly believed by everybody that there was only one course to follow in the choice of foods, and that was to follow one's instinct. But like so many of our cherished beliefs, this had to go overboard when science took the helm. Now we know that choice by instinct is not always right, and that it has to be tempered by intelligence. The newer knowledge of nutrition places before us convincing proof that it lies within our power to make a wise choice of foods, not only for the purpose of avoiding disturbances to health, but also of building up to higher levels, in a positive manner, whatever the constitutional inheritance with which we start life. There is no doubt that we can look forward to a day when our knowledge of foods and their nutritive values will place within our grasp a buoyant, life-prolonging health beyond our wildest dreams—even Wellsian dreams. It's a pity that the gods of

ancient Greece did not employ chemists, for then the secrets of ambrosia and nectar might have come down to us. Still, who knows but what we shall one day stumble upon these secrets of immortality in our researches into the mysteries of nutrition.

Hence it is that we are beginning to hear so much about nutritive values and the choice of foods based on these values. Now that the purity of foodstuffs is more or less assured by scientific manufacture and stringent control, the main centre of interest is shifting over to the question of their nutritive values.

It is true that we have not yet advanced far enough to be able to devise a way of measuring exactly the nutritive condition of an individual and of estimating precisely the nutritional effects of various foods on the human body. Until this is done, we shall no doubt continue to be plagued by the utter confusion of opinions of absurd faddists, diet quacks, and self-styled " nutritional experts ". As an extreme case, one is reminded of the American expert who advocated certain foods that explode in the intestines of women. Just what foods behave in this alarming fashion were unfortunately not disclosed—certainly not canned foods. Nevertheless, although the subject may have interesting possibilities for serious investigation, it is just conceivable that it might be connected up with " hydrogen swells " in the mind of some irresponsible person who knows nothing whatever about the subject. No doubt many ridiculous ideas get into circulation in some such way.

The Meaning of " Nutritive Value "

Most people have a vague idea of what is meant by the term " nutritive value," but when it comes to a precise definition the matter is not so easy. There are many factors which enter into consideration, and although some have received a fair amount of study there may be others which still await discovery. I will pass over the question of the energy value as expressed in calories, the presence of proteins of good biological value, and the content of fats and carbohydrates. In a general sense these values are higher in canned foods than they are in the corresponding foods cooked in the home, because only the most nourishing and appetising portions of the raw materials are selected for canning. In canned foods there is less water, and, what is more important, no waste matter such as bone, skin, stones, cores, and so on. It is a true case of " canned economy," for the whole of the contents of a can are consumed, whereas with ordinary foods the amount of waste is enormous. No one seems to have made an estimate of this amount, but it would be interesting to have average figures and to compare them with the economy of the ordinary open-grate coal fire in relation to that of the latest method of heating by means of gas or electricity, and indeed this simile is by no means an exaggerated one.

These are, of course, not the only points which have to be taken into account in discussing the nutritive value of any food. In addition, we have to reckon with the amounts present of two important groups of essential food constituents—namely, vitamins and mineral salts, particularly the former. It is not so much a question of the lack of information available concerning the vitamin contents of canned foods as the spread of the information among the public and among the members of the medical profession.

This is an important point in these days of intense competition among foodstuffs, especially as commercial interests have seized upon the vitamin story, and inflated it sky-high, with the result that we were at one time in danger of distorting the matter out of its true perspective. However, now that the excitement has calmed down somewhat, vitamins are being given their proper place among the other equally important food factors. When Sir Frederick Gowland Hopkins remarked the other day that " vitamins have been highly commercialised ", he was putting the case politely, although he probably had in mind more especially the administration of vitamins in concentrated form, which he warned us is not always desirable.

The Importance of Vitamins

Nevertheless, as Sir Frederick remarks, no one would doubt that vitamins must be present in minute yet adequate amounts in any diet which is to provide the ideal nutrition. This being the case, it is highly important that such facts as are known to scientists concerning the vitamin values of canned foods should be widely recognised, especially as it appears to be commonly suspected among the public that the vitamins present in fresh foodstuffs might be destroyed or in some ways harmed during the process of canning. This is, of course, not the case, as careful experiments have shown. Indeed, two years ago the special nutrition committee of the British Medical Association reported that " tinned foods, in particular tinned fruits, and tomatoes, afford a convenient and not too expensive means of obtaining certain vitamins and minerals during seasons when fresh fruit is unobtainable or expensive ". Certain it is that so positive a statement would not have been issued by this responsible body if there was the slightest doubt about the matter.

American Researches

But for the most exhaustive records of researches into the vitamin contents of canned foods we have to turn to the United States of America, and there we find that during the last ten years or so scientists have produced abundant evidence to show that the canning process has no appreciable effect on the vitamins present in the raw materials. Moreover, other experiments have proved that canned foods may be stored for long periods with insignificant or no loss of their vitamin contents. For example, it was found that canned tomatoes after three years were as rich in vitamins as raw tomatoes, and the same was shown to apply to strawberries when the tins were opened sixteen months after canning. The most destructive effects to vitamins are produced by heating in presence of air, as in ordinary cooking. On the other hand, relatively little harm is done when cooking is carried out in absence of air, as in canning.

There are, however, some people who are so patriotic that they will have nothing to do with any vitamins that are not true British born and bred. To satisfy these people, we have persuaded Miss Olliver to tell us something about these British vitamins. Miss Olliver is a member of the research staff of Messrs. Chivers, of Cambridge, and is well known to all of you as having been associated with Mr. T. Rendle in the discovery of a destructive fruit softening fungus known as *Byssochlamys fulva*. Recently Miss Olliver has turned her attention to the nutritive values of British canned fruits and vegetables, and I feel sure that her findings will prove to be of very great interest.

We are also fortunate in having with us another eminent authority, Dr. Henri Cheftel, of Paris, who has achieved fame throughout the world for his brilliant researches on canned foods. To Dr. Cheftel we extend a hearty welcome, along with the assurance that what he has to say about the question of nutritive values will be listened to with the greatest respect.

It is clear, therefore, that the canning industry and its scientists have gone to considerable trouble to ascertain the truth about the nutritive values of their products, but the unfortunate thing is that these facts are not yet fully appreciated by the public at large, and even by many members of the medical profession.

This is particularly unfortunate, because now that the interplay between food and health is beginning to be appreciated, the ordinary person is turning more and more to his family doctor for guidance in such matters. It seems clear, therefore, that steps should be taken to interest the latter in the modern knowledge of canned goods so as to ensure that the public receive their information from a reliable source for which they have a well-merited respect.

Spreading Information

Now we begin to see wisdom in the move recently made by the American Can Company when they started a series of authoritative statements concerning the nutritive values of canned foods in some 55 medical and dental journals having a very large circulation. This is claimed to be the first sustained campaign to put before the doctors, dentists, nurses, and health officers of America the scientific facts about canned foods. The point is made that every doctor has the problem of replying to the many nutrition questions

which are put to him by his patients. Some of these relate to the nutritive values of canned foods, and to their vitamin contents; others to their safety or wholesomeness; whether they are suitable for child or infant feeding. Still others relate to the details of canning procedures. It is pointed out that research extending over twenty years has established the answers to these questions, and the doctor is invited to indicate in what section of the subject his interest lies. Presumably the idea is to keep him posted with the latest scientific information.

It may be taken for granted that this step in publicity was only undertaken after a careful examination of the problem in all its bearings. If it was thought expedient to adopt this method of educating the American medical man, one is tempted to enquire how much greater is the necessity of extending the same or similar treatment to his British counterpart, who has been accustomed by tradition to adopt a more conservative attitude towards new knowledge, at least until he has fully satisfied himself that it is backed up by substantial evidence. This, of course, is as it should be, but the point is how can he satisfy himself if no one takes the trouble to supply him with the facts. Certainly the average practitioner is far too busy a man to spend time hunting out data for himself.

When we turn to a brief consideration of the nutritional aspects of mineral salts, we are impressed by the importance of the part played by calcium, phosphorus, iron, copper, iodine, and other elements in minute amounts in the maintenance of normal growth and healthy functioning of the body; there is, of course, no question that they are present in any less amount, or that they are in any degree less available in canned foods than they are in the corresponding raw materials. Canned fish, for example, have been repeatedly shown to be rich sources of iodine, and the careful determinations carried out by Dr. Lunde and Mr. Mathiesen at the Norwegian Canning Research Station are especially noteworthy.

There is one very interesting aspect of this subject which is, I think, deserving of mention, and that is the possibility which lies within grasp of the horticulturist specialising on produce for canning of increasing at will their vitamin or mineral contents in accordance with human nutritional requirements. I believe we are on the fringe of important developments, although there remains much ground to be covered by research workers in tracing out the effects of various types of soil, fertilisers, and so forth, in determining the amounts of the various elements taken up by plants, and the influence of certain of these elements on the synthesis of vitamins. No doubt the time will come when we shall be able to regulate the mineral and vitamin contents of canned foods beyond the dreams of our nutritional experts.

Miss M. Olliver, B.Sc., A.I.C., of Chivers and Sons, Ltd., Cambridge, as seen by our caricaturist while delivering her paper at the conference.

Variety of Diet

In reviewing the parts played by canned foods in the modern community, one should not lose sight of one very important aspect of the subject—namely, their contribution to the achievement of variety in diet, and the corresponding relief of monotony. Authorities on matters of diet and nutrition are in definite agreement that if there is a golden rule it is that of securing variety in our diet. And quite apart from this method of playing for safety in respect of the essential factors of food nutrition, monotony is not conducive to obtaining the best effects in the absence of that relish and enjoyment which variety brings to the table.

This function of canned foods in providing the community with a wide choice of fruits, vegetables, and so forth throughout the year is an untold blessing, and is one to which the British Medical Association has drawn special attention as a result of its exhaustive enquiries.

Not only does canning preserve in their original form the values which are of obvious significance in diet, but it also preserves the more subtle qualities of flavour and aroma, because, instead of being allowed to escape, as they do when cooking is performed in an open vessel, they are sealed within the confines of the can. Then, too, the texture and appearance of fruits and vegetables are retained in their original form by the scientific cooking adopted by the canner, far different from the mushy unattractive mass of shattered fragments which commonly emanates from the domestic kitchen. It is factors such as these which are apt to be overlooked, but which have an enormous psychological influence upon our powers of digestion, and hence upon our general health.

Finally, it should again be stressed that canned foods are fresh foods in the sense that they are packed immediately after being gathered from the fields. Thus the quality of freshness is also preserved, which is otherwise the case with much so-called fresh produce which does not reach the consumer until after the lapse of a considerable period of time, during which it is subject to the deteriorating influences of exposure and all kinds of contamination.

Research Organisations

Thus, even this hasty review is sufficient to show that there is no lack of scientifically established information on the question of nutritive values relating to canned foods. Nor is there any lack of scientific interest and supervision. Just the reverse, in fact. In support of this, one has only to remind you that for the past twenty years or so the American canning industry has had its various research organisations working at high pressure in co-operation with University Departments and other outside bodies, both scientific and medical, probing every nook and corner of the industry, and scrutinising almost every batch of canned product turned out in that vast country.

Vitamin Researches in England

By Miss M. Olliver, B.Sc., A.I.C.

The following is a summary of Miss Olliver's paper:

The paper opened with a brief account of the normal occurrence of vitamins and their dietetic value.

Vitamins are widely distributed through the majority of fresh foodstuffs and a well-varied diet will provide sufficient vitamins for normal health. There are, however, cases where a varied diet of fresh food cannot be obtained, and it is in such cases that the possibility of canned foods being able to supply the necessary vitamins becomes of great importance. For instance, the seasonal production of foodstuffs in England results at some seasons of the year in fresh food being sold at prices prohibitive in many households. At such times canned foods may be used to replace or supplement fresh food. Expeditions and localities with limited transport were cited as further examples.

In the research laboratories of Messrs. Chivers and Sons vitamin C determinations have been carried out on many raw fruits and vegetables, which have also been examined after commercial canning and household cooking. The work is still in progress, but it is hoped that a full report will be published later.

The available results show that a large percentage of vitamin C is retained in canning. One point which is often overlooked in this connection is that the ordinary consumer cooks all vegetables (except salads) and many fruits before eating them. It is therefore pointless from the economic view to compare the vitamin content of canned vegetables with raw vegetables, because only a limited number of vegetables are eaten raw and those only by a limited number of people. What is wanted primarily is the comparison between canned and house-cooked material rather than between canned and raw.

Many factors operating between the grower and the consumer of household-prepared foodstuffs bring about deterioration of the vitamin content of the raw material, and among these factors that associated with the canning process becomes insignificant. These factors include the decrease in vitamin C in fruits and vegetables on storage and the lack of careful regulation of cooking time by the housewife. Unfortunately the late arrival of members of the household at meals frequently extends unnecessarily the cooking time and hence decreases the amount of vitamin C. In both cooking and canning processes it has been found that a high percentage of vitamin C is extracted in the liquid in which the fruit or vegetable is cooked.

The amount of vitamin C in the final canned product depends on the concentration in the raw material and on the canning treatment. The amount in the uncanned material depends not only on the variety but also on the degree of maturity and length of storage. As regards the canning treatment, there is considerable decrease in vitamin C if the vegetable or fruit is blanched before canning, especially if the heated material is allowed to stand exposed to the air. Similarly a large head-space will reduce the amount of vitamin C.

Normal conditions of packing employed in the canning industry ensure the retention of the maximum amount of vitamin C as compared with other methods of preparation. There is, therefore, no reason why canned fruits and vegetables should not be regarded as an extremely valuable and palatable source of vitamin C.

Dr. Cheftel of Paris, as drawn by our caricaturist while addressing the conference. Dr. Cheftel spoke in fluent English and drew diagrams on the blackboard to illustrate his subject.

Nutritional Researches in France

By Dr. Henri Cheftel of Paris

After thanking the president and members of the Council for inviting him to address them, Dr. Cheftel said that beginning chronologically he would give them first of all the results of experiments commenced in 1931, and still going on, where rats were fed on a diet of canned food. It was a generally accepted fact that as far as rats were concerned these animals were not sensitive to a lack of vitamin C, but they were definitely sensitive to a lack of all other vitamins. These experiments had proved to be eminently satisfactory as far as the general nutritive qualities of canned foods were concerned. They had got rats of the ninth generation which were larger and fatter than those animals which had been fed upon the usual laboratory diet.

The lecturer drew diagrams on the blackboard to illustrate the various stages of the experiment and said that when the average weight of the can-fed rat was 210 gm., the weight in the case of the rat fed on normal diet was only 160 gm. The fact that all these animals were quite normal proved conclusively that the canned foods which had been given to them were quite sound. They also discovered by further investigation on death that the skeletons of these animals were quite well developed.

Experiments with guinea pigs, he said, had been conducted in the same way, although some difficulty was experienced at first because these animals were not well adapted to cooked foods, nor would they eat either meat products or fruits. Nevertheless they had obtained four generations of these animals which had demonstrated as good a growth and development when fed on canned foods as when given their normal diet. They had one guinea pig the weight of which was more than a kilogram after one year's feeding on canned foods. The animal had been examined very carefully and had shown no signs of scurvy. The guinea pig is an animal which is particularly sensitive to scurvy and is used extensively by research chemists for the examination of the anti-scorbutic properties of foods.

Dr. Cheftel referred to the work of Professor Giroud and gave some interesting details of experiments carried out by Dr. Giroud and himself with the object of revealing the presence of vitamin C in the body of the guinea pig. They consisted of the injection of an acid silver nitrate solution into the body of the animal, and the vitamin C—ascorbic acid—being the only compound in the animal's body which is able to reduce silver nitrate to silver, when the organs contain ascorbic acid the presence of this is shown by black deposits of metallic silver. The lecturer passed an interesting series of photographs around for examination by the members, showing the silver deposits revealed by this treatment. In the suprarenal glands the absence of vitamin C was revealed by a white tint when the animal was injected with silver nitrate. On the contrary, in the case of the animals which had been fed on canned food diet the suprarenal glands appeared black after injections with silver nitrate—a very definite indication of the presence of vitamin C.

The lecturer added that he once had occasion to carry out an experiment which indicated the effects of a canned diet upon man—although, of course, he had been unable to conduct his experiments in the same way as he had on the animals. In 1932-33 a French mission had been sent from the Continent to Greenland and fifteen men had to live in that country quite isolated over a period of thirteen months. He was one who had the good fortune to be called upon by the leader of the expedition to plan the diet of these men. They had a variety of food but absolutely no fresh food during many months. They brought with them a reserve of canned tomato juice and a reserve of lemons in case scurvy might be found to break out among them, but the result of their canned food diet proved so satisfactory that the greater portion of the lemons were brought back with them. They preferred the canned foods to raw lemons. Every one of the

(Continued on page 437.)

THE CARDIFF CONFERENCE

46, Dunkeld Road,
Bournemouth.
November 11, 1935.

The Editor,
Food Manufacture,
17, Stratford Place, London, W. 1.

Dear Sir,

The Ninth Annual Food Canning Convention recently held at Cardiff was, in the opinion of the majority present, an outstanding success—and for one principal reason.

For the first time in our short history a definite attempt was made to establish beyond dispute the nutritive value of Canned Foods. The crowded audience which met on the first day listened with keen interest to the opening paper of Dr. Cronshaw, a paper which envisaged the present position of the industry and which offered valuable suggestions for its improvement and development.

Very valuable contributory papers were read by Miss M. Olliver, Dr. Cheftel and Mr. Hirst, and a useful discussion followed. Full reports of these papers and the discussion will be issued later by the Council, in addition to the report in the present issue of this journal.

The meeting held the next day for further discussion on the subject was held in camera, and I am not at liberty to divulge any of its proceedings. I can, however, say that it was of equal interest to the former meetings, and I wish to tender my warmest thanks, not only to the openers of the discussion—Mr. Hirst, Dr. Cheftel and Sir Edgar Jones—but also to the subsequent speakers, particularly Mr. H. V. Taylor, Mr. Wilkinson, Mr. Rendle, Mr. Black, Dr. MacNaughton and Mr. Atkinson, all of whom added considerably to the value of the debate.

The Canning Industry is, I feel confident, embarking on a new and vital development in its history and one that will eventually make it a much greater one in this country.

To assist in this development I submit that the co-operation of everyone engaged in the industry—canners, growers, and the allied trades—is absolutely essential. Loyal support of your executive, a far better recognition of the valuable services rendered by the Campden Research Station, and a welding together of all the parties interested so as to work together in their mutual interests.

Personally, I feel that the dissemination of facts relating to the nutritive value and safety of packed and preserved foods should include, not only fruit and vegetables, but fish, meat, and all other foodstuffs, regardless of what type of container they are packed in. To the general public the term "Canned Food" includes all these methods of packing, and a menace to any one of these methods of packing reacts detrimentally to the sales of all the others. A newspaper "scare" in reference to alleged food poisoning does its insidious great harm to all the industry, regardless of whether the food referred to came out of a tin, glass, or aluminium container. The public does not discriminate or enquire; it simply condemns all "*preserved foods*", and sales are thereby adversely affected. I think the leading members of the Food Preserving Industry are too broad-minded ever to seek advancement of their own section by wishing to crab any other section.

In conclusion, may I offer my personal thanks for the honour conferred on me at Cardiff, and may I assure all members of the Food Preserving Industry of my honest intention of playing my small part in contributing to its increased development and success.

A. LL. Matthison,
President,
National Food Canning Council.

The Conference on the Nutritive Value of Canned Foods

(Continued from page 436).

fifteen men had been subjected to a daily medical visit, but no sign at all of any scurvy was discovered. This experiment showed that if it would not be quite possible to give canned food to men throughout their whole lives, at least canned foods containing vitamin C were quite sufficient to keep them in perfect health for at least twelve months, and not only that, but near the Poles, where the climatic conditions were intensely difficult to cope with.

More recent work had been accomplished in France by M. Lecoq, who, as chief of the laboratory of St. Germain's Hospital, is not connected in any way with the canning business and had made his experiments quite independently. He started on peas. These were sterilised 240° F. and he experimented with them on guinea pigs, rats and pigeons. The experiments with pigeons had proved very interesting because they were particularly sensitive to the lack of vitamin B, and it was the first occasion, to his knowledge, that they had been used for experiments on canned foods. in his summing up of the results of his experiments M. Lecoq had written that " Vitamin C is very largely preserved in canned foods, and that it would be unfair to say, as it is frequently done, that the canning of vegetables carries with it the destruction of vitamins."

Dr. Cheftel said that there was abundant evidence arising out of their experiments to prove that in the case of animals which were unfit and ailing, as soon as they received a supply of vitamin C in the form of a canned food diet they improved rapidly in all the principal organs.

In his final summing up the lecturer said that it had been demonstrated that as far as vitamins A, B, D, and E were concerned they were definitely retained in the canning process. As far as vitamin C was concerned that was also retained, although it was sensitive to oxidation. Attention had been drawn, on the other hand, to the sensitiveness of vitamin A to light. The results had shown that it was possible to obtain perfect health among small animals during many generations without giving them any fresh foods, and it had to be borne in mind, also, that these animals were much more sensitive than were men. That was why, principally, they had been selected for the purpose of experiment. For instance, the guinea pig dies of scurvy in from thirty to forty days, while man could live for six or seven months before showing visible symptoms of this disease. Again, these animals were always accustomed to the eating of raw foods in their normal state, while man had for many generations acquired the habit of eating cooked foods. So that while feeding man on canned diet there was not the fear of finding at the start of the experiment that he was not able to eat the quantity which was necessary for the supply of vitamins. He stressed, finally, the fact that it was possible to obtain a varied diet of canned foods in any part of the world and at any time.

(*To be continued.*)

Mechanical Progress *in the* Bakery Trade

By EDMUND B. BENNION, M.Sc.Tech., A.I.C.
(National Bakery School, London)

MACHINERY IS now so generally an accepted part of the equipment of all bakery establishments that each year improvements are made in all the recognised machines commonly in use, while new machines are continuously being evolved.

A glance at the patent literature year by year shows how much research is being expended on better and more efficient machines. Besides these there are many new machines and improvements carried out through the skill and thought of bakery managers and their staff engineers employed on production work.

Mass Production Units

Mechanical units have been evolved for all branches of the bakery trade—both bread and confectionery, particularly Swiss rolls, sponge goods, and slab cakes and biscuits—and while mechanical improvement in each of the various machines used for each type of article has facilitated production and increased productivity, there have been several individual points which have exerted a marked influence on the development of mass production work.

The development of different types of travelling ovens brought problems which have had to be solved. The use of chain conveyors in the swinging chain type of conveyor in baking chambers of various construction showed the importance of correct lubrication in such units if breakdowns were to be avoided. The question of high working temperatures, steam, and acid in the steam of the oven, all had their influence and only by a comprehensive study of all these has the difficulty been overcome.

The most recent step in travelling ovens has been the use of travelling steel bands of increasing length year by year. These are particularly used in biscuit ovens and Swiss roll plants as well as in smaller ovens for sponge goods where quick baking is required. The use of such bands has revolutionised the baking and manufacture of biscuits and Swiss rolls.

The greatest mechanical difficulty which had to be overcome was the maintenance of an even tension on the band in order to prevent buckling. This involves not only mechanical adjustments but also careful temperature control not only during working periods but at other times.

Dough Mixing Machinery

The slow speed dough mixers retain their popularity in this country, the high speed mixers of American usage not having gained any ground since a few of them were introduced about ten years ago.

Most bakery engineers have the open pan machines on their list, some with one working oven, others with two. Of the latter type in some cases the two arms work together, while in other types there is a reciprocating motion.

The most revolutionary change in mixing machines was introduced some years ago in the Peerless Rotex machine, in which the pan only revolves and the working arm is stationary, mixing taking place by centrifugal action.

Drum machines are still manufactured, but are not considered to be suitable for present-day methods of production.

Moulders

Improvements take place in the designs of moulders and new ones are continually evolved, the object of which is to give a less severe treatment to the dough. This year several moulders have been introduced, one of which is intended to mould tin bread with as gentle an action as possible, in place of the more severe action of the spindle moulders. For this purpose bands travelling at different speeds are utilised with considerable success. As with all types of machines, the working must be properly understood before the best results are obtained, but as there are no moving metallic surfaces in contact with the dough, the machine is really simplicity itself. Another type of machine for moulding any piece of dough from 2 oz. to 2 lb. is a useful addition to bakery machinery, for it should prove a convenient all-purpose machine in many medium-sized bakeries. The latest type of bun moulding machine is an all-purpose plant for all small pieces of almost any kind of dough.

Dough Fermentation Rooms

Up to the present time much attention has not been paid to the mechanical equipment of dough fermentation rooms beyond the installation of the open pan mixers with the necessary extra movable pans, the number depending on the size of the trade. There are few bakeries where air conditioning is used in fermentation rooms, and apart from the installation of radiators to maintain a suitable temperature, little attention is paid to the humidity of the air. Of recent years the question of knocking back of doughs has received considerable attention but no finality has been reached.

In the Ormeau Bakery in Belfast the only mechanical unit for satisfactorily controlling dough fermentation and development has been evolved after many years of research. This has been patented by the bakery company. On the top floor of the building is the dough mixing room, where scientific control is exercised. Below on the next floor is a large circular dough room which has been constructed mainly of glass in between the necessary steel supports. There are two platforms which are circular in

form and which revolve one above the other as required, being propelled by electric drive. On each platform are fermentation vessels of stainless steel, circular in shape, but with sloping sides and a flat bottom fitted with a hand operated valve. These containers are staggered around the platform so as to give the maximum number.

On the platform below are a similar number of vessels. The doughs are transferred from the upper containers to those underneath by means of opening the valve after a definite degree of fermentation has been reached. Automatically the dough falls by gravity. In passing from the top tier to the lower container the dough is actually cut and stretched and so receives an efficient knocking back with some stretching as well. The platforms revolve during the process, and after they have completed one revolution the doughs pass from the top containers to those below where, after a complete revolution, they pass to the divider, being fed in by a series of rollers to prevent any short weight occurring during the dividing. Further, the mechanical action of the roller tends to increase the pile of the crumb.

This dough room, which works on the merry-go-round principle, is maintained at the even temperature of 80° F., while a suitable humidity is easily maintained by an atomising jet of water.

Two units similar to this are shortly to be installed in the bakery of the United Co-operative Baking Society in Glasgow when their bread bakery has been remodelled.

Conveyors

The use of conveyors for transport of goods in the bakery is becoming more popular, and the travelling conveyor for removing baked goods from the ovens to the cooling and packing rooms is becoming an essential feature of all bakeries large or small. Further, this type is rapidly replacing gravity conveyors, which have never been completely successful mainly because they are erratic and noisy and may cause faults in cakes by undue vibration produced in them as they are in the delicate state on leaving the oven.

Cake Making Machines

With cake making machines there has been the same progress as with dough mixing machines, all makers producing similar models of all-purpose machines each with their own modification, some with different speeds of operation, others with variable gear boxes giving a much wider range of speed than is available on the standard machines. The latest development in several models is the attachment of an air whisk, by means of which compressed air is forced through a specially constructed bottom in the mixing bowl, enabling the maximum aeration to be obtained in the minimum of time, also enabling the most efficient aeration to be obtained with certain types of mixes which are not so easily aerated in the ordinary machines. This will probably become a standard fitting with all the better type machines during the next few years. Further, in cake making machines, automatic timing switches are nowadays standard items of equipment.

Improvements are continually being made for processing ingredients prior to their use in the actual production of the cake. In this way fruit cleansing, stoning, and stirring machines are general items of equipment.

Whither Progress?

Progress is being made year by year in the development of bakery machinery and the saturation point is far from reached. The question may be asked in what direction further progress lies. The answer must be in the introduction of any machinery which will save wasteful mechanical labour and unnecessary hard work, and, further, accomplish operations as successfully as, or more so than, they could be done by human beings.

Moreover, increased sales depend on the introduction of cheaper machines on mass production lines which will be efficient but which will not last for twenty years or more as too many machines do to-day.

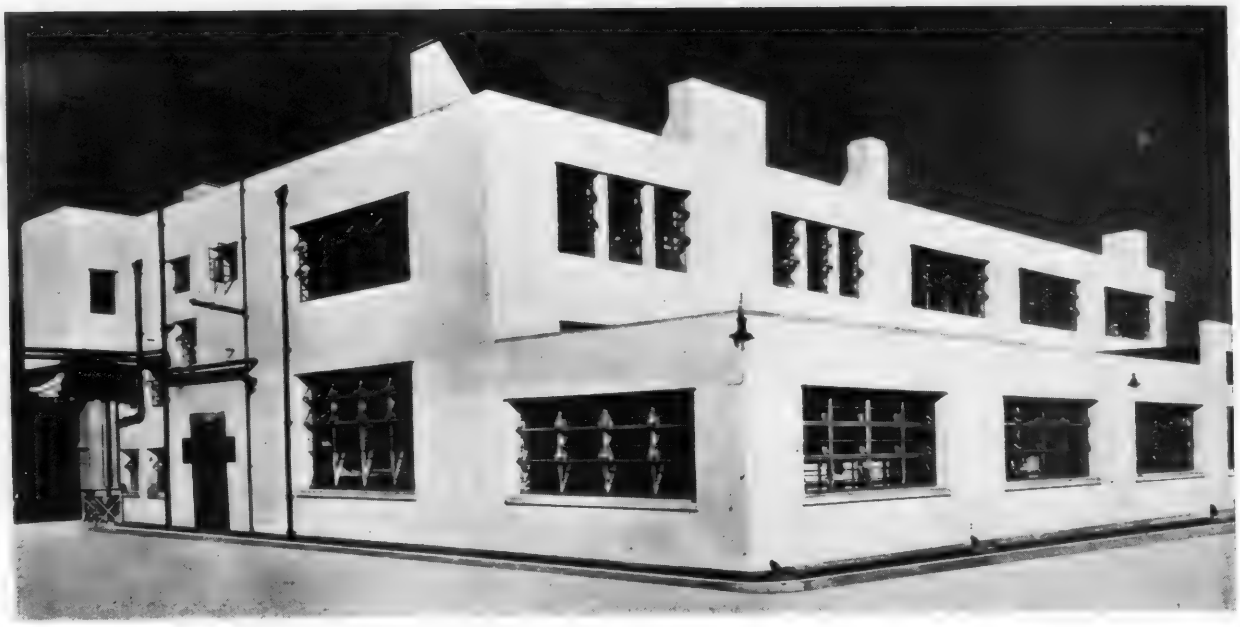
For the many bakers a machine suitable for heavy duty, such as is expected by machines used in mass production units, is not required. At the present time such machines are often purchased either because of their reputation or because there are none other available. Such machines are found to be in perfectly sound working order twenty years later—yet out of date. Lighter machines at lower prices with ten years of life guaranteed as a maximum would find a large market. Further, by the introduction of such machines more initiative for research would be stimulated and so radical improvements in design might be effected, for it is certain that finality has not been reached in many pieces of baking machinery. The lead of the motor manufacturers might be followed with great financial success to those who are willing to take the plunge.

LOCUST BEAN GUM FOR STABILISING FOOD

ACCORDING to *The Glass Packer*, a contemporary American journal, Kraft Phenix Cheese Corporation, Chicago, has received U.S. Patent 2,007,218 for what is claimed to be a remarkably efficient stabilising and emulsifying agent for salad dressings, chocolate milk drinks, cheeses, ice-cream, and other emulsified food products. Better quality is said to be obtained by the use of locust bean gum, particularly in combination with Irish moss and gum Karaya.

Locust bean gum, it is stated, possesses characteristics markedly different from other gums. This is particularly true of its greater water swelling or absorbing properties as well as its property of drying from a water solution to a clear and transparent, continuous, flexible, and water-resisting film. These properties are attributed to the absence of any material amount of bassorin or cerasin in this type of gum.

The Irish moss is recommended for its ability to neutralise the tendency of the locust bean gum to precipitate casein out of suspension. The gum Karaya combats the tendency of the bean gum to dehydrate the material and produce a dry and crumbly product. The suggested proportions for the new emulsifying agent are: 65 parts locust bean gum, 35 parts Irish moss and 15 parts gum Karaya.



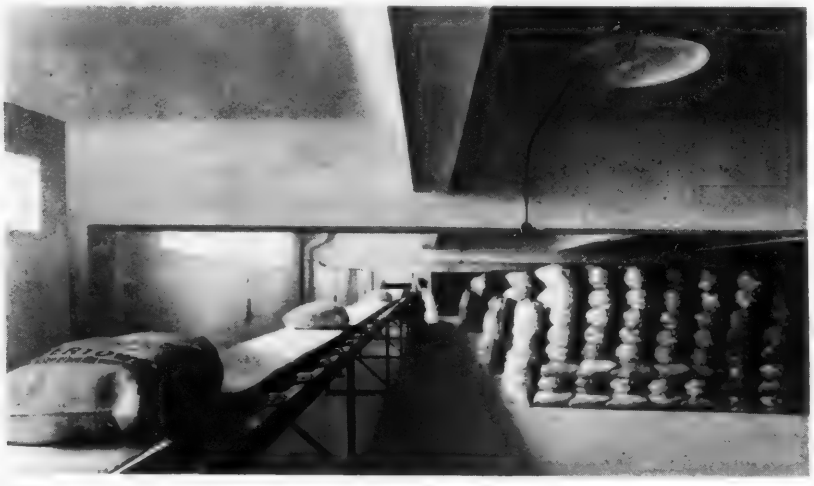
A MODERN BAKERY

(A description of a visit to the new bakery of the Royal Arsenal Co-operative Society at Mitcham)

BAKERY ENGINEERS will find much that is both interesting and instructive in the equipment and layout of the new bakery belonging to the Royal Arsenal Co-operative Society, which was opened on November 2 at Mitcham in Surrey. We paid a visit to this bakery and have been greatly impressed by the technical skill which has gone into its construction and internal arrangements.

The general design of the building is well brought out in the accompanying photograph. It occupies an area of 10,200 square feet on a site adjoining the dairy which was opened last year; it is a two-storey structure of reinforced concrete faced with white cement and, as can be seen from the illustration, is well supplied with windows and means for securing adequate ventilation.

Inside it is evident that careful attention has been given to the attainment of generous space and cleanliness. The walls are faced with glazed white tiles and the floors with buff-coloured tiles, while the ceilings are covered with a special preparation which completes the facilities for maintaining the highest possible degree of cleanliness throughout the building. When we were there, in the afternoon, the floors were being scrubbed and the equipment cleansed preparatory to the start of operations later in the evening.



The flour storage loft at the new bakery of the R.A.C.S. at Mitcham, showing sacks of flour, which have been brought up on an elevator, being conveyed to the point of storage.

On arrival at the bakery the sacks of flour are hoisted direct from the lorry to the storage loft by means of an electrically driven elevator. There it is examined and occasional check samples are submitted to laboratory tests, as are also the consignments of yeast and other materials.

The Storage Loft

In the storage loft the sacks of flour are passed on to a broad conveyor belt that traverses the entire length of one side of the loft. By means of

Flour blender, sifter and weigher, which is fed by flour from the storage loft and delivers into the dough bowl below, the exact amount of flour required for one mixing of dough.

an ingenious tripping gear the sacks are then discharged from the belt on to the operator's shoulders at any point, so that the heavy manual labour of stacking the sacks is considerably lightened. The storage capacity of the loft is approximately 2,000 sacks, or 250 tons of flour, and although a very wide margin of safety has been allowed in the construction of the building, an additional precaution has been adopted against overloading the floor at any point by making the roof rather low.

Blending and Weighing

The sacks are emptied through a hatchway in the wall of the storage loft and the flour is conveyed by an elevator to the top of the combined blender, sifter, and weigher situated in the adjoining room. The blend of the flour must, of course, be determined by the seasoned judgment of the baker, but this machines does all the actual work, thoroughly blending the flour, passing it through a sieve, and finally weighing the exact amount of flour required for one mixing of dough, this flour being then discharged into a large metal-lined dough bowl placed beneath the machine. This equipment is a very interesting one and is but rarely to be seen in bakeries.

Dough Mixing

When it has received its quota of flour the dough bowl is wheeled into position on one of the two large mixing machines to be seen in the background of the accompanying picture of the dough room. On the right is the smaller mixer which is used in the preparation of Vienna bread. The addition of water and yeast is made from an electrically operated tempering tank which ensures the correct temperature of the water, which, of course, has previously been filtered and purified.

After this addition, the conical cover of the mixer is closed down over the bowl and the kneading arm is set to work, while the dough bowl revolves in the usual manner. Ten minutes later the bowl is removed from the mixer and set aside to allow the dough to rise. The thirty large dough bowls are numbered and are used in strict rotation.

The next operation is to tip the mass of dough from the bowls down into the hoppers in the baking hall below. These tippers are a distinctive feature of the new bakery and they enable the great masses of dough to be tipped simply by pressing a button.

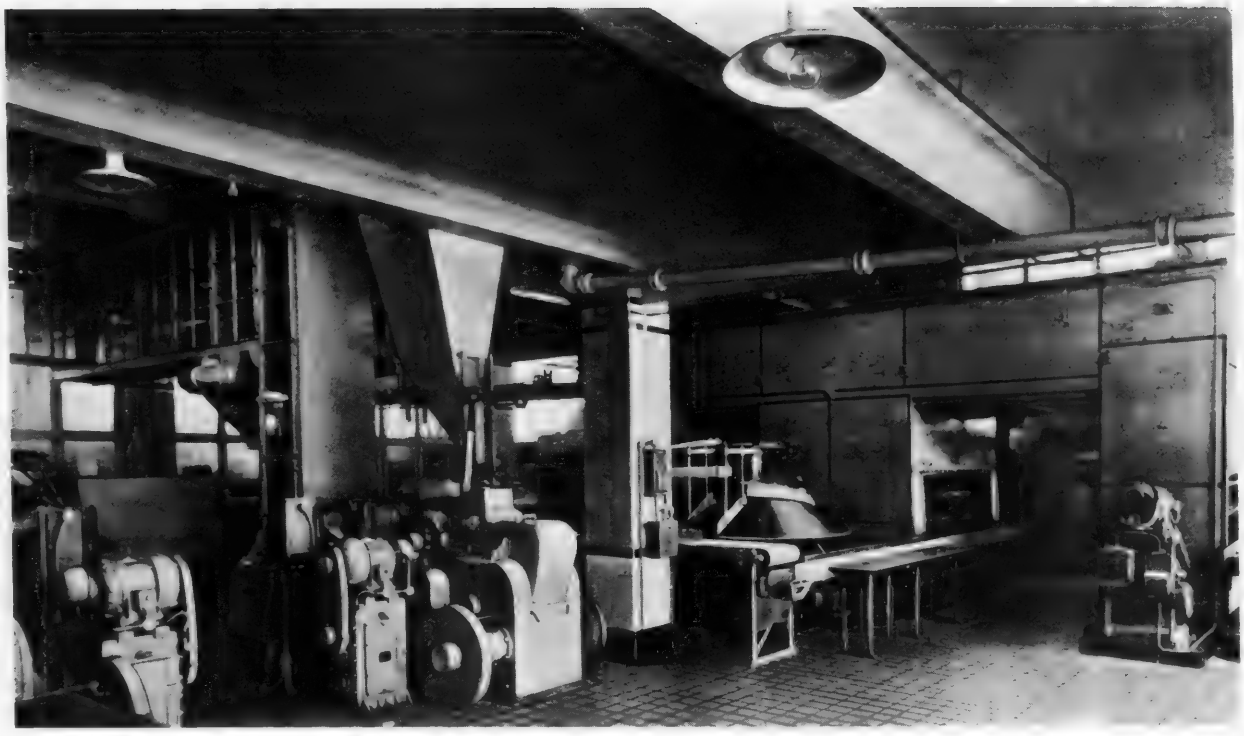
Dividing and Proving

In the baking hall the dough passes to one of the two dividers and thence makes a passage, occupying some fifteen minutes, of the first prover, which, as can be seen in the photograph, consists of a glass-walled chamber traversed to and fro by an endless belt bearing linen pockets for the dough.

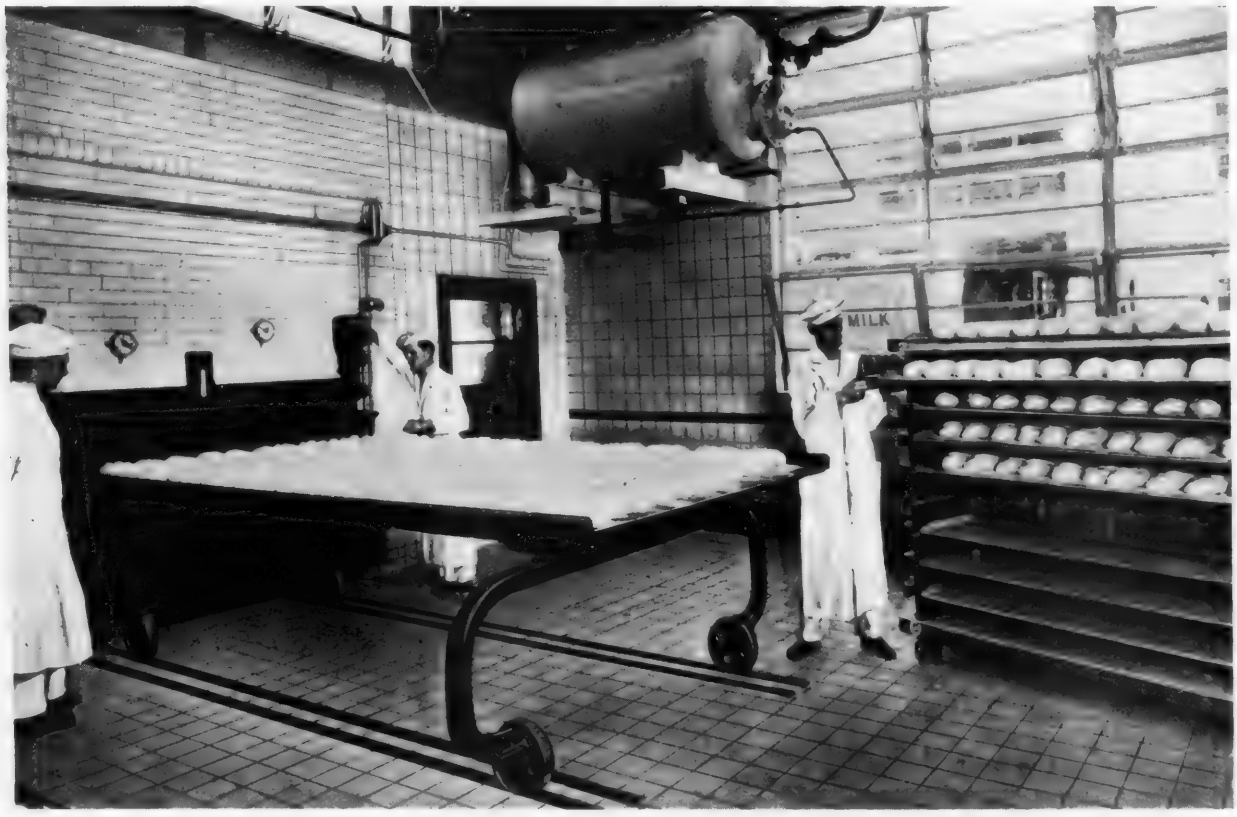
Moulding

Next, the dough travels along a conveyor so arranged that the former can be diverted either through the tin-shape moulder, through the "umbrella" moulder for

A general view of the dough room. The blender is shown on the left; the mixing machines, where the water and yeast are added, are in the background; while in the right foreground is the dough tipper.



Two views at the new R.A.C.S. Bakery, Mitcham, of the baking hall where the dough passes through the dividers and provers. The top illustration shows the final prover on the right and the first prover on the left, the dividers and the "umbrella" moulder also being visible. On the right of the illustration below is the oven setter with a loaded drawplate just about to be inserted into the drawplate oven.



coburg or cottage loaves, or through the special moulder for long loaves. A by-pass from the dough room is also provided to enable the Vienna dough to travel to the place where it is moulded by hand.

The Travelling Oven

If the moulded dough is intended for the travelling oven, it passes along a conveyor to the final prover, where it is transferred to tins or pans which move slowly through the prover on an endless chain of shelves, the journey occupying about twenty minutes and leading straight to the door of the travelling oven. The dimensions of this oven are 65 by 10 by 10 feet. It is electrically driven and is fired by oil fuel. The time taken to travel from end to end is about forty-five minutes.

The Drawplate Ovens

For the baking of long loaves four oil-fired double-deck drawplate ovens have been installed, and built in with them are two small ovens for Vienna bread and rolls in a variety of fancy shapes. The moulded dough for the drawplates, instead of passing through the final prover, is transferred to one of the oven setters, which are protected by canvas curtains.

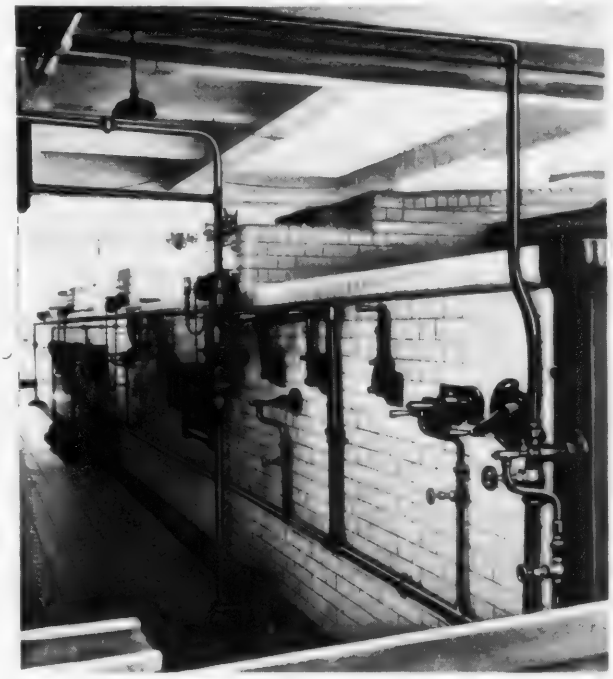
Cooling and Dispatching

Upon emerging from the ovens, the bread is transfered to large galvanised metal racks, which are wheeled into the spacious cooling room adjoining the baking hall. One side of this room gives on to the loading bank and is furnished with a row of cubicles so designed that the bread can be transferred straight from the cooling racks to the delivery vans without being exposed to any contaminating influence.

Feeding the travelling oven with tin loaves, which travel from the prover straight to the door of the oven.

Such is, in outline, the layout of this interesting new bakery at Mitcham. In conclusion, it should be said that the entire plant is electrically driven, an arrangement which considerably facilitates the observance of cleanliness. As for the workers, there is a large dining room and several well-appointed bathrooms at their disposal, and when one compares the conditions under which they now work with those in the old-style bakehouse one finds it difficult to imagine any further improvements which would be outside the luxury class.

The installation of plant at the bakery was carried out by Baker Perkins Ltd., and the illustrations were kindly lent to us by the Royal Arsenal Co-operative Society.



The travelling oven, which is electrically driven and fired by oil fuel. The dimensions are 65 by 10 by 10 feet.

Loaves emerging from the travelling oven, the time of transit from end to end being about 45 minutes.

The CONCHING of CHOCOLATE MASS

By Dr. A. Laessig

AN ARTICLE in a recent issue of *Gordian* admirably sums up the function of the conch in the treatment of chocolate mass. Four main objects are achieved:

(1) Expulsion of the moisture still retained in the mass, as well as of tannic acid and free acetic acid.

(2) Ripening of the mass in conjunction with gentle supplementary roasting of the cocoa.

(3) Full development of aroma.

(4) Homogenisation of the processed mass to give the smooth "velvety" texture.

The author rightly emphasises the close dependence of each of these conching effects upon certain factors:

(1) The nature of the cocoa beans used.

(2) The methods adopted for roasting, or drying, the cocoa beans.

(3) The nature of the milling process to which the mass is subjected before conching.

A description is given of an actual test under manufacturing conditions, using markedly sour, blue Bahia beans, stress being laid upon the fact that a mild-tasting, aromatic chocolate mass can never be produced from such cocoa beans even with the aid of normal roasting, oft-repeated fine milling and unusually prolonged treatment in the conch. A cocoa mass with a tolerable flavour can only be obtained from sour, violet, or blue beans by highly drastic roasting in conjunction, of course, with repeated fine rolling. And it need hardly be added that this should be followed by a suitable conching treatment when sugar and cocoa butter are incorporated for the purpose of homogenisation. On the other hand, the writer proceeds, mild-flavoured cocoa beans with a brown fracture should only be gently dried, and the masses produced from such beans acquire a better aroma and flavour after treatment in the longitudinal or tank type of machine than after working up in any type of circular conch. He unreservedly recommends the longitudinal machine for high quality chocolates, the circular conch serving for the conching of cheaper masses which, for economic reasons, are frequently manufactured from sour, bluish-coloured beans.

The statement that high quality chocolate masses can only be satisfactorily treated in the longitudinal type of machine calls, in the present writer's view, for some qualification. It may be conceded that this machine is applicable to high quality chocolates where less consideration need be given to the question of higher running costs arising out of increasing expenditure on power, steam, space and time. But it is going too far to assert that this object cannot be attained with the circular conch, which, in its latest improved design, is equally as efficient as the longitudinal machine, especially when air-heated. Suitable modification must naturally be made in the entire conching procedure. The circular conch must be heated up to a specified temperature, and should be operated at a moderately high speed, which should more especially be reduced towards the end of the conching period when the mass has attained a soft liquid condition. Control for this purpose is readily attained with the latest design of machine. Both the longitudinal and the circular conch of modern design are equally applicable to the production of high quality chocolates.

But entirely different considerations arise when dealing with the conching of cheap masses where every effort must be made to reduce expenditure on energy, steam, wages, time and space to a minimum. Decided preference must here be given to the circular conch, which achieves intimate smoothing and homogenisation much more rapidly and at a lower cost.

Milling

It need not be stressed that the milling process with its production of a maximum degree of grain fineness is an important preliminary to the conching process. Badly milled chocolate never acquires full smoothness even after the most prolonged conching treatment, for the latter does not appreciably increase the degree of fineness. But the more thoroughly the mass has been prepared by repeated milling the more rapidly and more easily is the homogenisation and intimate smoothing of the various ingredients of the mass accomplished in the conch. Prolonged milling, when the mass flows from the roller surfaces in an extremely thin film, obviously produces an extremely large increase in surface and thus promotes oxidation of tannins by contact with atmospheric oxygen. Other accompanying advantages are aeration, evaporation, and partial elimination of moisture. The more frequently, the more thoroughly, and the finer the chocolate mass is milled or ground before entering the conch, the more readily is the first of the above-mentioned conditions (expulsion of moisture, excess tannic acid, and free acetic acid) brought about. The remaining two objects—the so-called ripening of the mass and the development of aroma—are likewise very appreciably facilitated by initial repeated milling or grinding of the mass. Actual smoothing and homogenisation of the various mass ingredients can, of course, only be carried out during the final conching process.

Quality of Beans

But even after efficient preliminary fine-milling of the chocolate mass, the conching treatment, in prolonged application, will not achieve the desired object if the raw beans are not up to a satisfactory standard and are not roasted or dried on the right lines.

It has been elsewhere stated that when processing sour, bluish cocoa beans, the quality of the resulting chocolates can only be improved by previously submitting the

beans to drastic roasting. In the writer's opinion, however, all that such a step can do is to convert the blue-violet colour of the beans into a dark brown. Again, the pronounced sour taste is toned down because higher roasting temperatures cause decomposition of tannic acid and, especially, acetic acid. But the beans will then acquire a sharply acrid flavour and their aroma will certainly not be improved by the destruction of the enzymes. Incidentally the small quantity of aroma substance still present in the beans during the roasting process will be completely or almost completely expelled.

Supplementary Fermentation

Quality deterioration following on drastic roasting can be more conveniently prevented by carefully controlled supplementary fermentation which does not destroy those ingredients responsible for aroma and mild flavour. One of the issues of *Gordian* (No. 914) contained a very interesting article on "a solubilising process for cocoa beans," giving precise instructions for quality improvement of sour and blue cocoa beans in connection with their use in chocolate manufacture. This process failed to achieve popularity when first introduced owing to certain practical difficulties which have now been eliminated. It may be taken for granted that a supplementary fermentation procedure is far more to the point than drastic roasting treatment in any type of roasting drum. But it is by no means a universal panacea for the improvement of cocoa bean flavour and aroma. It is only to be applied to defectively fermented bluish beans containing an excessive amount of tannin substances and to which excess of acetic acid has imparted a sour taste. Well fermented beans with a brown fracture, fitting loosely in the shells, naturally do not call for supplementary fermentation. Nor would anything be gained by such treatment when applied to batches of beans which have suffered overheating in the producing countries owing to application of the wrong sort of drying apparatus and the enzymes of which have consequently been destroyed. Indeed, the whole principle of supplementary fermentation is aimed exclusively at the possibility of reviving enzymatic activity. Batches of beans which have been spoilt by overheating during drying—when they are actually often over-roasted—appear with unfortunate frequency, especially in shipments from Brazilian ports. They do not, however, deceive the expert buyer.

Roasting

In the course of the above-mentioned article in *Gordian* it is correctly stated that under no circumstances should good, mild-flavoured and brown beans be subjected to intense roasting, but, instead, should be gently dried. Severe roasting treatment can only lead to deterioration of cocoa beans in which flavour and aroma have almost reached their full development. Anything in the shape of a roasting process would spoil the aroma as well as the flavour, owing to contact with acrid roast gases. The same writer goes on to describe an experiment in the course of which Arriba beans were first thoroughly washed and then transported in a thin wide layer on lattice grates through a chain oven. The chocolate mass produced after completion of the conching process in a longitudinal machine exhibited a surprisingly good and mild flavour as well as a fully developed aroma. Now it may be as well to point out that this roundabout laborious series of operations can be replaced by a single combination washing, aerating and drying plant. The beans are washed in a suitably constructed continuous-working machine, and the drying is carried out with the aid of an automatic cascade drier far more efficiently than is possible in a chain oven. The warm air issuing from the cascade drier is used to pre-heat the beans as they emerge from the washing machine.

Conditions for Conching

In the light of the above considerations it will be realised that the following conditions should be fulfilled in any conching process:

(1) First-rate quality of beans or improvement in quality by the appropriate degree of supplementary fermentation.

(2) Gentle drying at temperatures below 75° C., where possible in combination with thorough aeration.

(3) Preliminary washing in a suitably constructed machine prior to aeration and drying.

OPPORTUNITIES FOR BRITISH FOOD AND DRINK IN THE NEAR EAST

ACCORDING to the report recently issued by the Department of Overseas Trade with regard to economic conditions in Palestine, there is an important and increasing market in that country for British food and drink. The report shows the following imports into Palestine in 1934:

Fish, dry and salted	£38,000	of which U.K.	supplied	£14,000
Tinned fish	49,000	do.	do.	42,000
Sugar and sugar candy	151,000	do.	do.	4,000
Glucose	40,000	do.	do.	9,000
Plain chocolates	20,000	do.	do.	8,000
Milk powder	11,000	do.	do.	1,000
Biscuits	9,000	do.	do.	4,000
Condensed milk	16,000	do.	do.	2,000
Beer	£40,000	of which U.K.	supplied	£10,000
Wines and spirits	16,000	do.	do.	about 10,000

These facts may be of interest in view of the forthcoming Levant Fair of 1936, which is to be held as in 1934 at Tel-Aviv, Palestine, from April 30 to May 30, 1936. The Fair is held biennially. Special foreign reductions are available for exhibitors, and a Customs clearing and transport service will be arranged. The 1934 Fair was attended by over 600,000 visitors from Palestine and all parts of the Near East, direct sales being estimated at over £500,000 and indirectly at a far greater amount.

INDUSTRIAL NEWS

New President of National Food Canning Council

At the annual meeting of the National Food Canning Council held at Engineers' Institute, Park Place, Cardiff, on Wednesday, October 30, at 10 a.m., Mr. A. Ll. Matthison, joint managing director of Arthur Holden and Sons, Ltd., varnish, enamel, and lacquer makers, was unanimously elected president for next year.

The retiring president was Mr. S. W. Smedley, chairman of the National Canning Co., Ltd.

Death of Mr. W. J. Foster

It is with regret that we have to announce that Mr. W. J. Foster, who recently retired from the service of A. Boake, Roberts and Co., Ltd., died on October 13.

The Late Mr. W. J. Foster.

Mr. Foster had been in service since 1914 and visited regularly the firm's customers in the South of England and Wales. Several times his retirement was discussed with him, as his health was not robust, but he preferred to continue at his work.

His many friends will miss him greatly and be surprised to learn that, in spite of his youthful appearance, he had reached the age of 68 years.

Mr. M. W. Ferris has taken over the representation of A. Boake, Roberts and Co., Ltd., in Wales and the south-western counties of England. He has been trained in the company's works and offices and has had five years' regular experience amongst London customers. He is making his home in Weston-super-Mare.

Milk Bar Developments

We understand that plans are in hand for installing over a thousand milk bars in Britain by next summer in towns and cities and popular seaside resorts.

Milk bars installed at various exhibitions by the Milk Marketing Board and the National Milk Publicity Council have achieved some remarkable results and it has been estimated that it would be possible by this means to increase liquid milk consumption in England and Wales by some 1,500,000 gallons a month.

Large stores in Manchester, Liverpool, and Newcastle are setting up milk bars; a chain of them is under consideration by a large London dairy company for London.

Spanish Apricots

The regulation of the importation of apricot preserves from Spain into France has led to the possibility of French preserve makers using a larger quantity of mirabelle plums than usual this year.

The preserve makers are, however, asking the growers of this fruit to be very careful of its quality when delivered, as if spotted or wormy fruit is delivered it will mean extra cost and unsatisfactory preserves and may lead to consumers demanding that the Spanish apricots be let in again.

New Mitcham Bakery

A new bakery, claimed to be as fine as any in the world, was opened by the Royal Arsenal Co-operative Society at Mitcham, Surrey, on Saturday, November 2, occupying an area of 10,200 sq. ft. and having an output capacity of 25 million half-quartern loaves per year.

The opening ceremony, which was attended by the Mayor of Mitcham, was presided over by Mr. J. T. Sheppard (Chairman of the R.A.C.S.), and Mr. F. J. Comerton (Chairman of the Food Trades Sub-Committee) declared the bakery open.

A full description of the bakery appears on pages 440-443 of this issue.

New Fruit Carrying Vessel

An order has been placed with Lithgows, Ltd., of Port Glasgow, for a twin screw mail, passenger, and fruit vessel to be named *Jamaica Planter*, for the Jamaica-Rotterdam-London service of the Jamaica Producers Association.

The vessel will be fully insulated—the temperatures will be controlled by the rotary air circulation system patented by the Liverpool Refrigeration Co., Ltd., whose refrigerating machinery, comprising two triple cylinder sleeve valve ammonia compressors, each direct coupled to variable speed electric motors, will also be fitted.

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The telephone number of the Lipscombe Air Conditioning Co., Ltd., has been changed to Whitehall 1922.

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Mr. A. R. G. Williams and Mr. R. M. L. Francis, both of National Adhesives Ltd., enjoying a joke in the stand of "Food Industries Weekly," our allied weekly periodical, at the Imperial Fruit Show and Canners' Exhibition at Cardiff. (*F. M. Photograph.*)

Glaxo Laboratories

A company with the title Glaxo Laboratories, Ltd., has been registered for the purpose of taking over the goodwill, trade marks, and assets of the Glaxo Laboratories department of Joseph Nathan and Co.

Glaxo Laboratories, Ltd., has been formed to facilitate the working of the department when established in the new factory, laboratories, and offices which are now being completed at Greenford, Middlesex.

The registered capital of Glaxo Laboratories, Ltd., is £400,000, in ordinary shares of £1, the whole of which are held by or on behalf of Joseph Nathan and Co. There will be no public issue, and the names of the new board of directors will be published immediately.

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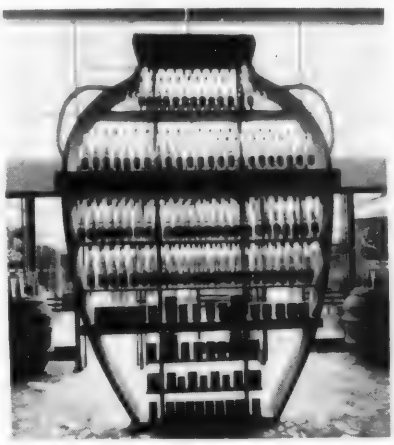

An interesting Display of Italian Oil at the Brussels Exhibition.

P. Samuelson and Co. Extension

Messrs. P. Samuelson and Co., of 17, Creechurch Lane, Leadenhall Street, London, E.C. 3, the well-known importers of essential oils, are extending their business to include all citrus products, and are now representing in the United Kingdom the firm of Fratelli Ricciardi of Messina, Sicily.

Messrs. Ricciardi are actual producers of citrus oils, juices, and peels-in-brine, their up-to-date factory being situated in the heart of the best lemon-growing district south of Messina.

This branch of Messrs. Samuelsons' business will be in charge of Mr. Stanley Waite, who has spent several years in Sicily. Mr. Waite invites enquiries from interested firms.

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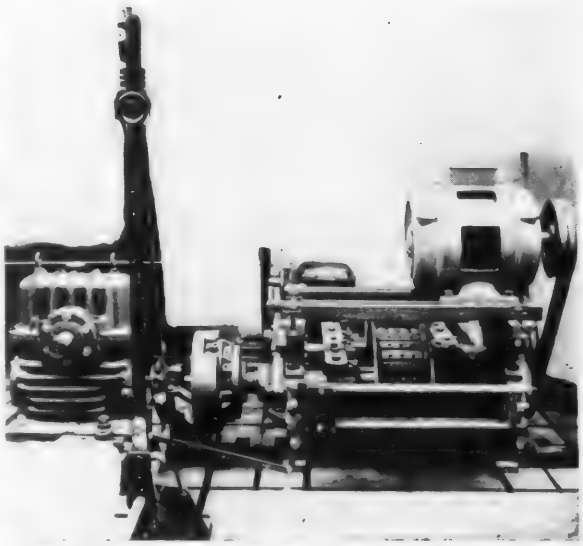
As from November 9, 1935, the offices of the L.C. Engineering Supplies, Ltd., will be transferred to the works at 245, Burlington Road, New Malden, Surrey, the telephone numbers being Malden 0451 and 2470.

Inconel

Henry Wiggin and Co., Ltd., report the use of Inconel in the dairy industry for agitators, filter bowls, filter supply tanks, filter forewarmers, heaters, holders, hoppers, milk pails, pasteurisers, pipe lines, pumps, receiving vats, regenerators, ripeners, storage tanks, and many other applications.

For an alloy of such recent introduction, the increasing popularity of Inconel is good evidence of the part it may occupy in the near future in other appropriate sections of the food industry.



Crofts Variable Speed Machine Drive, giving an infinite speed variation between 20 and 80 r.p.m. and provided with a declutching arrangement to ensure that after declutching the machine will restart at its original minimum speed.

Kemball, Bishop and Co., Ltd. Extend

Kemball, Bishop and Co., Ltd., Bromley-by-Bow, London, E. 3, are busily engaged in the erection of a large seven-story building for the purpose of manufacturing Citrate of Lime and Citric Acid by the Pfizer process. Chas. Pfizer and Co., Inc., of New York, were the inventors of and the first firm in the world to use a fermentation process for this purpose on a large commercial scale.

"Food Industries" of the U.S.A.

In our Industrial News of last month, we drew attention to the moisture-resisting package for confectionery, developed in the U.S.A. We acknowledge the illustration and the source of this information to our well-known contemporary publication, *Food Industries* of the U.S.A.

"Pfaudler" Glass-lined Equipment

Enamelled Metal Products Corporation (1933), Ltd., Artillery House, Artillery Row, London, S.W. 1, have sent us a specimen of their new catalogue, which deals with the application of "Pfaudler" glass-lined equipment to the chemical and allied industries.

The catalogue deals principally with the "Pfaudler" glass-lined equipment which the company is able to offer from its British works at Leven, Fife. It is very comprehensive, and gives specifications, tables of capacities, dimensions, etc., for practically every type of unit. In addition, the company is prepared to design equipment for individual needs. The catalogue is well illustrated throughout.

Milling and Baking Apparatus

A fine comprehensive catalogue dealing with Laboratory Apparatus for the Milling, Baking, Grain, Seed, and Allied Trades has been sent to us by A. Gallenkamp and Co., Ltd., "Technico House", Finsbury Square, London, E.C. 2.

The cover is of semi-stiff paper and the catalogue contains 88 pages of art paper. It is extensively illustrated throughout. A summary of the contents is given on the inside page of the front cover, while the last three pages of the catalogue are taken up with a useful index.

Now that scientific methods to control the quality and uniformity of products are becoming more general, the need for a comprehensive and up-to-date list of apparatus for these trades is obvious. This need has been met by this catalogue, the contents of which have been selected with a view to including all the requisites for general testing and the most recent methods and research.

"Theo" Hand Moist Wiper

The "Theo" Hand Moist Wiper, supplied by Theo and Co., Ltd., 32, Tarleton Street, Liverpool, is stated to dissolve, absorb, and neutralise tar, paint, grease, oil, nicotine, and inkstains, etc. The wiper is supplied in a moist retaining envelope, and after use it should be replaced in its envelope so as to keep moist. No matter how soiled or black the wiper gets it is stated to do its duty until worn to shreds. The dirt, tar, paint, etc., absorbed by the wiper is neutralised in it after a short interval between each operation, and it will not transfer what it has previously collected.

The Phosphatase Test

Attention has recently been directed to the Phosphatase Test for the detection of raw or insufficiently heated milk in pasteurised milk. This test is conveniently carried out with the help of the B.D.H Lovibond Limitester.

The B.D.H. Lovibond Limitester—a small instrument containing a Lovibond slide and a test-tube.

It is a simple form of comparator for use in limit tests in which a certain specified depth of colour must not be exceeded. The apparatus consists of a small bakelite comparator containing a standard Lovibond glass and a space for a test-tube, and thus affords a ready means of comparing the colours produced in a series of tests with a permanent standard colour.

The British Drug Houses, Ltd., Graham Street, City Road, London, N. 1, have sent us a small booklet dealing with this subject and which they will be pleased to supply to Public Analysts, Medical Officers of Health, or anyone concerned with the efficient pasteurisation of milk.

Circular Chart Recorders

The Drayton Regulator and Instrument Co., Ltd., West Drayton, Middlesex, have sent us a copy of their recently published broadsheet illustrating the Drayton Circular Chart Type Recorders for temperature, pressure, and liquid levels.

The broadsheet is attractively produced in green and cream and has numerous illustrations of the company's recorders. It is stated that the construction of these instruments is robust and accuracy within close limits is guaranteed over the whole scale. Various standard case constructions are available, so that instruments suitable for special conditions are obtainable.

Power Factor Correction

In these days of rapidly increasing electrical loads it is useful to remember that whenever power users purchase electrical energy on any tariff, other than one depending solely upon the kilo-watt-hours of energy used, low power factor means high power bills. Substantial economy may, however, be effected by considerable numbers of power users in this category.

The Dubilier Condenser Co. (1925), Ltd., have sent us two of their booklets giving comprehensive information on power factor correction from both the commercial and technical standpoints. In a large number of cases the installation of condensers will effect substantial reductions in electricity bills, and the company state that the extent of the economy varies from 5 to 30 per cent., so that the cost of the condensers is saved usually within two years of installation.

Non-Alcoholic Fruit Wines

We have received from William Hay, Ltd., 42-46, Walmsley Street, Hull, a copy of their latest publication dealing with the manufacture and marketing of non-alcoholic fruit wines and cordials.

A number of attractive labels in a variety of colours for ginger and fruit wines have been pasted inside and help to make the booklet extremely attractive. Recipes and instructions are given for the making of a number of wines with different flavours.

Colour Tests

Two interesting instruments made by Tintometer, Ltd., are the B.D.H. Lovibond Nessleriser and the B.D.H. Lovibond Limitester. The Nessleriser has been specially designed for colorimetric determination of minute amounts of various substances. Colour standards are at present available for the determination of nitrites, ammonia, chlorine, iron, phosphate, and *p*H values, and other tests are being standardised to this instrument.

The Limitester is described in a previous paragraph under "The Phosphatase Test".

*p*H Value of the Soil

Particulars have been sent to us by the Cambridge Instrument Co., Ltd., of an important new instrument, the Cambridge *p*H Meter for determining the *p*H value of the soil, so that the condition of the soil can be adjusted according to the crop it has to bear by the addition of suitable chemicals. A greatly increased yield is thus obtained, and it is also found possible to grow in the open air, on a commercial scale, fruits that hitherto could only be grown under glass in this country.

This firm has also solved the problem connected with the determination of pan temperature in the manufacture of condensed milk by means of the Cambridge Patented Illuminated Moving Scale Indicator used in conjunction with special quick-reading electrical distance thermometers.

Crompton Parkinson's Accounts

The business of Crompton Parkinson, Ltd., which was established as F. and A. Parkinson, Ltd, at Guiseley, near Leeds, in 1913, has had a particularly rapid growth. The present issued capital is £912,019, of which £241,294 is in ordinary shares and the balance in preference, there being no debentures. For the year ended September 30 the net profits amounted to £243,810 as compared with £131,809 in the previous year. The bulk of the increase is placed to general reserve, which receives £154,377 against £55,234. The sum of £10,000 is paid to the trustees of a Central Benevolent Fund. The ordinary cash dividend is maintained at 12½ per cent., together with a capital bonus in ordinary shares of 7 per cent., the same as last year. This distribution of 19½ per cent. is modest in view of the fact that the amount earned on the ordinary shares is rather more than 100 per cent. It has, however, been decided that a further bonus of 100 per cent. in ordinary shares shall be distributed, which will mean the capitalisation of £241,294 of the reserves.

Mr. Frank Parkinson, Chairman and Joint Managing Director of Crompton Parkinson, Ltd.

BREAD CONSUMPTION

A *Letter from Prof. J. C. Drummond, D.Sc.*

Department of Physiology and Biochemistry, University of London.

In your Editorial last month you refer to the striking decline in the *per capita* consumption of bread which has been taking placing for some years past and which is now causing commercial interests such as the Millers' Mutual Association a good deal of worry and expense. You state that so far no really satisfactory explanation has been put forward, but I am inclined to think that one of the possible causes you mention is almost entirely responsible.

Most authorities would dismiss, I think, the mechanicalisation of industry and the modern craze for slimming as playing any significant part. The root of the matter is the change in the character of the diet in those countries in which the standard of living is, in spite of minor fluctuations, gradually rising. Whatever may be said about the nutritive value of bread, one cannot ignore the fact that from the standpoint of the social economist bread is the food of poverty. The total amount of food taken by the average person does not vary significantly from day to day, and it follows that if more of one type of food is consumed the amount of the others is curtailed. A rise in the standard of living means that more of the expensive forms of food are consumed—that is, more meat, fats, fruit, and luxury articles, such as sweets, cakes, sweet drinks and ice-creams.

The level of the calorific intake of the ordinary individual is much the same each day. An increased consumption of sweet foods and of fats means inevitably that less bread is eaten. The relationship is shown in a very striking manner by the curves representing changes in the consumption of flour on the one hand and sugar on the other during the past 30 or 40 years. The curves are complementary and present an almost identical picture, whether we look at those representing the consumption in the United States (Publication No. 8, Stanford University, California, July, 1926) or those for an isolated community such as a large boys' public school (*The Schoolboy: His Nutrition, Physical Development and Health*, Dr. G. E. Friend, 1935).

It is to me a matter of great surprise that commercial interests have embarked on a press campaign involving enormous expense when it should have been obvious to them that the downward movement in the consumption of bread is inevitable and cannot to any appreciable extent be arrested by such efforts as they are making.

J. C. Drummond.

THE CANNERS' GOLF AT CARDIFF

On the heights of the Southerdown Golf Course grim determination was necessary to complete a round with a score that would be worthy of winning one of the coveted prizes, for wind at gale force and relentless rain persisted throughout the morning. Nevertheless there was a splendid muster at the Golf House, nine couples taking the field, and despite the wind and the rain some good scores were returned, Mr. Maurice Batchelor tying for the lowest net score with Mr. Howard Harding, of Belfast.

The following are the pairs who went out to battle against the weather and bogey :

R. M. L. Francis, Esq., National Adhesives, Ltd., and W. Lenox, Esq., L.C. Engineering Supplies, Ltd.

A. A. Maytham, Esq., Dewey and Almey, Ltd., and Keith Fraser, Esq., Leonard Hill Limited.

R. J. O. Compston, Esq., L.C. Engineering Supplies, Ltd., and R. F. Graham, Esq., G.C. Engineering Co., Ltd.

F. W. Winterson, Esq., W. P. Hartley, Ltd., and N. P. Gold, Esq., Eburite Corrugated Containers, Ltd.

Mrs. E. H. Gasking, Batchelor and Co. (Sheffield), Ltd., and W. Leonard Hill, Esq., Leonard Hill Limited.

M. W. Batchelor, Esq., Batchelor and Co. (Sheffield), Ltd., and R. J. Cox, Esq., Metal Box Co., Ltd.

J. McNaughton, Esq., Vacuum Refrigerators, Ltd., and R. Harold Morgan, Esq.

F. W. Andrews, Esq., and A. W. Hosegood, Esq., Wilts United Dairies, Ltd.

H. Harding, Esq., Ulster Tin Box Co., and Donald Meacock, Esq., Grovesend Tinplate Co.

The prizewinners were :

H. Harding, Esq., Ulster Tin Box Co., Ltd., Food Manufacture Challenge Cup and Replica.

Maurice Batchelor, Esq., Batchelors, Ltd., Eburite Cup and Replica.

A. A. Maytham, Esq., Dewey and Almy, Ltd., lowest gross for prize given by G. Fell Clark, Esq.

R. M. L. Francis, Esq., National Adhesives, Ltd., hidden nine holes prize, given by A. A. Maytham, Esq.

D. Meacock, Esq., Grovesend Tinplate Co., won the sweepstake.

During the luncheon the sun struggled through and in the afternoon the four-ball match was played in more pleasant conditions. The winners were Mr. Maurice Batchelor and Mr. K. Fraser, two down on bogey.

The prizes were kindly presented during the Food Canning Convention Ball, which was held in Cardiff on Wednesday, October 30.

NUTRITION AND HEALTH

The members of the Committee of World Experts on Nutrition, nominated by the chairman of the Health Committee of the League of Nations, who met in London on Monday, November 25, at the London School of Hygiene and Tropical Medicine, were the following :

Dr. Durig (Professor of Physiology, Vienna University); M. L. Alquier (Director of the Institut d'Hygiène Alimentaire, Paris); M. L. Lapicqui (Professor of Physiology at the Sorbonne); Mr. G. Schiotz (Professor of Hygiene, Oslo University); Mr. E. P. Cathcart (Regius Professor of Physiology, Glasgow University); Professor E. Mellanby (Secretary-General of the British Medical Research Council); Sir John Orr (Rowett Research Institute, Aberdeen); Mr. E. V. McCollum (Professor of Biochemistry, Johns Hopkins University, Baltimore); Dr. W. Sebrell (U.S.A. National Institute of Hygiene); Dr. Mary Schwartz Rose (Columbia University); and Professor Sbarsky (Director of the Central Institute of Nutrition in Moscow).

The resolution on nutrition, unanimously accepted by the League Assembly, called for a thorough enquiry into improved nutrition, from the point of view both of national public health and of world agriculture, and for the presentation to the next Assembly of a report covering both these aspects.

It was not expected that this committee would reach decisions at one meeting, but it is likely that the lines of an initial report to the main committee have been agreed upon.

INFORMATION and ADVICE

Ice-cream—Sauces—Biscuits

Ice-cream

1,950. *We have already bought the book which you recommended on ice-cream manufacture, but it is not exactly what we want.*

What we require is a recipe for making first-class ice-cream, incorporating butter and cream. (Wales.)

The following are three formulæ, together with their analyses, based on the use of ingredients of average analytical quality:

1.	*Lb.*	*Analysis.*	
			Per Cent.
Full cream milk	58·10	Fat	18
Butter (unsalted)	11·92	M.S.N.F.	10
50 per cent. cream	11·91	Sugar	13½
Sugar	13·50	Gelatin	½
Gelatin	00·50		
Skim milk powder	4·07		
	100·00	Total solids	42

We are informed that this is a first-class formula giving a rich ice-cream. An emulsifier or homogeniser is essential to the compounding of mixes containing butter. Skim milk powder is, in our experience, the best generally available serum solids concentrate to use.

2.	*Lb.*	*Analysis.*	
			Per Cent.
Full cream milk	67·303	Fat	12½
50 per cent. cream	7·570	M.S.N.F.	10
Butter (unsalted)	7·570	Sugar	13½
Sugar	13·500	Gelatin	½
Gelatin	00·500		
Skim milk powder	3·557		
	100·000	Total solids	36½

A good standard mix, one-third less rich in fat than (1), but quite rich enough; in fact, round about optimum richness for ordinary trade. Again an emulsifier or homogeniser is necessary to the compounding of same.

3.	*Lb.*	*Analysis.*	
			Per Cent.
Full cream milk	49·40	Fat	18
50 per cent. cream	32·60	M.S.N.F.	10
Skim milk powder	4·00	Sugar	13½
Sugar	13·50	Gelatin	½
Gelatin	00·50		
	100·00	Total solids	42

We have calculated (3) as alternative to (1), of identical analytical constitution, but omitting butter. All mix formulæ are given on 100 lb. (about 9 gal.) batches, mixes of any desired weight or volume can obviously, by simple arithmetic, be computed therefrom. Milk has been assumed, Fat=3·5 per cent.; M.S.N.F.=9 per cent. Cream assumed, Fat=50 per cent.; M.S.N.F.=4·5 per cent. Butter, Fat=84 per cent.; M.S.N.F.=1·5 per cent. Skim milk powder=100 per cent. M.S.N.F. All mixes should take 80 to 100 per cent. overrun. Mixes should be pasteurised at 155° F. or thereabouts and homogenised at this temperature and a pressure of 2,500 lb. per sqr. inch, cooled, and aged a minimum of 6 hours prior to freezing.

Formula (3) can, of course, be made without a homogeniser or emulsifier, though a decided improvement in texture results from homogenisation, which incidentally is to be preferred to emulsification.

Sauces

1,951. *Our friends are desirous of our introducing to them some sauce recipes, as they intend marketing these. Knowing that you would be able to be of assistance to them we should be very glad if you would oblige.* (England.)

Although we are always glad to be of assistance to subscribers to this journal, you will realise that the large number of formulæ for sauces which is possible does not permit us to be of much practical assistance.

What we always do in such cases is to recommend the enquirer to secure the services of a food chemist or practical sauce maker to undertake the work, so as to produce a sauce which, besides having a certain individuality, will meet with the particular requirements of the enquirer.

We are, however, sending you two examples which will give you a rough idea of the composition of some of these products.

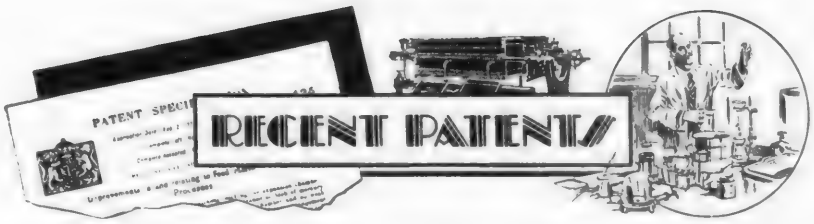
Biscuits

1,952. *In the article "Food Industries in Czechoslovakia," by Mr. J. G. F. Druce, on page 231, mention is made of a special kind of wafer called Oplatky, or Oblaten, manufactured in Karlsbad.*

We are interested in obtaining further information of this wafer, and would appreciate any assistance you could give us in obtaining a description or sample of same. If you could arrange to have a sample forwarded to us we should be pleased to remit incidental expenses. (Australia.)

With reference to your enquiry regarding the wafer Oplatky, you could best obtain a sample by writing to Messrs. Bayer, Karlsbad, Czechoslovakia.

The Oplatky, or Oblaten, is a sweet circular wafer about 6 inches in diameter. Instead of using ordinary water for the flour and sugar, sprudel water (containing $Na_2SO_4NaHCO_3$, K, Ca, Mg, and other salts, and charged with CO_2He, Ar, and also relatively rich in radium emanation) is used.



These particulars of New Patents of interest to readers have been selected from the "Official Journal of Patents", and are published by permission of the Controller of H.M. Stationery Office. The "Official Journal of Patents" can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

Latest Patent Applications

27214. ASPINALL, SIR A. E.: Treatment of sugar-cane juices, etc. October 2.
27366. FARRER, J. O. (CONTINENTAL CAN CO.): Packaging of beverages. October 3.
28022. SOC. MANTELET AND BOUCHER: Fruit presses. October 10.
28077. MOULTON, D. C.: Treatment of fruit juices, etc. October 11.
28309. WHITTEMORE, A. J.: Food storage receptacles. October 14.
28516. GIACOMA, J.: Containers for perishable goods. October 15. (France, October 15, 1934.)
28590. NYROP, A.: Apparatus for extraction of vitamins. October 16.
28596. GRIFFITH LABORATORIES, INC.: Meat-curing substances. October 16. (United States, October 30, 1934.)
28818. GALVIN, H. D., L. C. ENGINEERING SUPPLIES, LTD.: Cooking apparatus for treating tins of food. October 18.
29015. SMITH, P. N., WOOLDRIDGE, H. B.: Beverages. October 21.
29180. HECKERMANN, H.: Preservation of perishable articles, etc. October 22.
29216. ARMSTRONG, J. J. V. (NICHOLSON): Apparatus for preservation of perishable substances. October 23.
29268 and 29269. CLARKE, F. J.: Manufacture of confections. October 23.
29379. GREEN, E. S., HALL, LTD., J. AND E.: Storage of fruit, etc. October 24.
29579. DOLMAN, H. J.: Apparatus for plucking poultry. October 26.
29691. MANSTED, S. A. J.: Moulds for freezing cream, etc. October 28.
29835. JENSON, O. V.: Apparatus for preventing the infection of milk. October 29.
29927. DENFORD, H.: Treatment of wrappers for the preservation of carcases. October 30.
30024. MACILWAINE, A. W.: Treatment of cocoa beans. October 31.
30169. WOTTON, E.: Means for preserving eggs. November 1.
30232. GONIN, B. W.: Process for the collection of vitamins from vitamin-containing bodies. November 1.
30269. ROCHWOOD AND CO.: Preparation of cocoa butter for shipment, etc. November 1.

Complete Specifications Accepted

435,587. RASMUSSEN, A. GERNER-: Preservation of fruits.
436,591. FRIEDEL, A. F. J.: Process of producing nutrient material for the growth of yeast cells.
435,613. RASMUSSEN, A. GERNER-: Preservation of fruits. (Addition to 435,587.) (Divided out of 435,587.)
436,028. LUTHJE, DR. H.: Preparation of an adjunct in baking from starch.
436,050. JOOS, O. H.: Process for improving the baking qualities of flour.
436,116. JALOWETZ, E., and HAMBURG, M.: Production of coffee substitutes from cereals.
436,353. MASON, W. C., and HUTCHESON, W. W.: Process for drying potatoes and the like vegetables, also applicable to cereals such as wheat and barley.
436,436. WATERMAN, H. I., and WAESBERGHE, F. A. M. J. S. VAN: Preparation of wort and of beverages by fermenting this wort.
436,713. WINTHROP CHEMICAL CO., INC.: Water-miscible vitamin preparations containing vitamin D. (May 29, 1934.)
436,765. CEROBREX, LTD.: Processes for treating and stabilising wheat germ.
436,855. SWIFT AND CO.: Methods of treating meat and the products resulting therefrom.
436,981. GROVES, W. W. (I.G. FARBENINDUSTRIE AKT.-GES.): Protective envelopes of paper or the like suitable for containing food.
437,048. CLARKE, W. L., and BENHAM AND SONS, LTD.: Low-pressure food steamers.
437,243. DEUTSCHE HYDRIERWERKE AKT.-GES.: Gelatine products and the like and their manufacture. (April 7, 1934.)
437,314. LÜTHJE, H.: Manufacturing process for a depolymerised starch to be used as adjunct in baking. (July 6, 1933.)
437,379. COOPER, R. P., and REYNOLDS, A.: Apparatus for the preparation of coffee.
437,492. TRIGGS, W. W. (CHAPEL BROS., INC.): Process of producing a readily digested meat-protein preparation.
437,495. MÖLLER, G., and PETERSON, P.: Method and apparatus for preserving eggs, meat, fish, vegetables, or other victuals by means of carbonic acid or another indifferent gas.

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

Abstracts of Recent Specifications

Group Abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, either sheet by sheet as issued on payment of a subscription of 5s. per Group Volume, or in bound volumes price 2s. each.

430,428. GROUP VI. **Pasteurising liquids.** STAVNSBJERG, J. R. H., 4, Storchsvej, Copenhagen.

In apparatus for pasteurising milk, beer, etc., in bottles or other containers, consisting of a series of compartments filled with water or other liquid heating medium which circulates therethrough, and into which are placed baskets or like receptacles in which the bottles are inserted, the compartments being successively and periodically heated up to and held at pasteurising temperature, the openings between the compartments are controlled by valves, each of which is constructed for co-operation with the baskets so that it closes—*e.g.*, by its own weight or under spring influence—when there is no basket in the compartment next after the valve in the direction of the liquid circulation, and it is opened and kept open by the basket when the latter is placed in this compartment. The valve may consist of a pivotally mounted flap with levers, which are engaged by the bottom of the basket, the valve closing by its own weight when the basket is removed. When the compartments each contain a basket the valves will all be open and the water circulates freely through the apparatus. To obtain even circulation, one side of each basket consists of a plate, which forms with the compartment wall a chamber up which the water must pass and over the top edge of plate, which may be formed as a separate portion vertically adjustable to vary the height. Wedges are provided to force the basket and plate against angle irons. The water may be circulated on immersion of the baskets only or by a pump connected between the first and last compartments, which are also connected by another pipe. Overflow is discharged from a compartment through a container and pipe. Excess water is discharged from each compartment by a valve which is connected to a flat spring, which extends into the next compartment, where it is engaged by the basket therein, to keep the valve closed, the valve opening when the basket is removed. The extent to which the valve opens is regulated by a screw.

431,143. **Nutrient preparations from flesh of sea animals.** SCHMALFUSS, DR. H., and WERNER, DR. H., Jungiusstr. 9, Hamburg 36, Germany.
A process is claimed whereby the flesh of whale, herring, and the like is subdivided, mixed with water, the mixture warmed to 80° to 96° C., and the aqueous extract separated (*e.g.*, by filtration or centrifuging) from the fat and albumen, together with ingredients possessing undesirable odour or flavour. Clear concentrated aqueous solutions containing less than 20 per cent. of water, rich in creatin, creatinine, peptone, and albumoses, and lacking the odour or flavour of fish or train oil, are isolated. (Convention date, Germany, July 8, 1933.)

431,804. **Cereal beverage products.** CONTINENTAL CAN CO., INC., 100, East 42nd Street, New York, U.S.A.
According to the process specified, a dry cereal beverage product is obtained by subjecting a roasted mixture of saccharine material and cereal tissues to sufficient mechanical pressure to rupture the cells without completely disintegrating the tissues. In this manner, it is claimed, firm

individual flakes are obtained of such uniform thinness as to permit ready extraction of the soluble ingredients. All the common cereals are amenable to the process, including wheat, rye, corn, and barley. The saccharine material may be selected from such products as sugar, glucose syrup, and molasses, with the addition, if desired, of figs, prunes, or other fruits. The preferred ingredients, however, are wheat, bran, and New Orleans molasses. Roasting is continued to the point where the sugar in the molasses is thoroughly caramelised. (Convention date, U.S.A., April 3, 1933.)

432,075. **Low-temperature production of milk powder.** J. B. M. KNUTSEN, 19, Barcom Avenue, Darlinghurst, near Sydney, New South Wales, Australia.

Whole fresh milk is first concentrated at a low temperature by evaporation of most of the water under a predetermined degree of vacuum, the viscous concentrate being then completely dried by spraying into a pure hydrogen atmosphere. A cheap source of hydrogen is producer gas, which can also be used as a power-medium for the complete plant. The temperature at any stage of the process does not rise much above the normal temperature of fresh milk or the body temperature of the cow. Reference is made to an earlier process whereby whole fresh milk is sprayed into a current of heated non-oxidising gas such as nitrogen, hydrogen, or carbon dioxide. (Convention date, Australia, October 14, 1933.)

432,396. **Condiment with soya bean base.** STRANGE COMPANY, W. J., 2549, West Madison Street, Chicago, Ill., U.S.A.

A dry siftable preparation containing a soya bean product as base is claimed to follow absorption of suitable quantity of liquid or semi-liquid flavouring—*e.g.*, a mixture of oleoresin and essential oil—in a soya bean product (such as the flour) in such proportions as to yield a dry powder. The base may consist of flour prepared from the whole bean or from the partly or completely defatted bean. The soya proteins alone are also applicable. The process is carried out in the absence of any added water. Suitable oleoresins are oily liquids or semi-solids isolated from pepper, ginger, nutmeg, etc., while the essential oil ingredients are of the usual type derived from mace, nutmeg, coriander, and other spices. The special advantage of this type of condiment is absence of separation of the oily flavours from the carrier. It is also claimed that the flavours do not cook off from the carrier as readily as when a sugar base is used. The products do not cake or gum to a greater extent than is usual for a natural soya bean flour.

432,552. GROUP XIII. **Drying apparatus.** BOSTOCK, H., 55, Gloucester Road, Regent's Park, London.

Vacuum apparatus for drying timber, milk, fruit, vegetables, grass, laundry, etc., of the kind comprising a base and a domed cover adapted to sit on the base is provided with an internal water-operated ejector-type exhauster which with its associated parts is carried by the base entirely independent of the cover. In one form the base of the vacuum chamber is of metal and is supported by a flanged metal ring 3 resting on a table 4. A metal dome 7 is placed on the base 1, a gasket 8 of rubber, etc., being interposed. A false bottom 5 rests on base 1 and carries the material to be treated. The exhauster 9 is supplied with water drawn from a tank 12 by a pump 13, the water returning from the exhauster through a pipe 15 to the tank 12. The suction pipe 10 from the exhauster 9 passes outside the base 1 to a cock 11 and the back into the chamber.

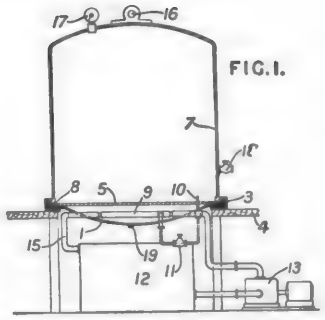


FIG. 1.

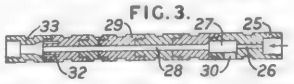


FIG. 3.

The dome 7 has a lifting eye 16, a pressure gauge 17, and a tap 18 for connecting it to the atmosphere, and the base 1 has a drain plug 19. The ejector 9 may alternatively be supplied with water direct from the mains, the tank 12 and pump 13 being omitted. In a modification the base 1 is made in one piece with the dome 7, a detachable lid being provided. The exhauster 9 is built up from a plurality of sections, those in the middle part 29, Fig. 3, being interchangeable so that the length may be varied. The water is supplied to section 25 and passes through channel 26 to a chamber 27 which has a suction pipe connection 30. The water with indrawn air passes through a channel 28 in the middle part 29 to a wider bore in the final section 33, an annular chamber 32 being provided to prevent entry of air. The provisional specification describes the use of an exhauster worked electrically or by foot or hand, and the replacement of the dome and base by a cylindrical vessel having a door of boiler plate or other metal held on by bolts, etc.

NEW COMPANIES

Anglo-Danish Trout Company, Limited. Cross Street, Fish Docks, Grimsby. To carry on the bus. of trout breeders, etc. Nom. Cap.: £1,500. Dirs.: H. B. Ingram, Westholme, Healing, Grimsby; C. Sorensen and N. Joker, addresses not stated.

Chester Castle Products, Limited. 3, York Street, Manchester. To carry on the bus. of importers, exporters, dlrs. in cheese, milk, condensed milk, etc. Nom. Cap.: £1,000. Dirs.: D. H. Skermer, 2, Aldersgate Road, Stockport; A. M. Findley, 32, Regent Road, Stockport.

Cocoa and Colonial Merchants, Limited. Shell Mex House, Strand, W.C. To carry on the bus. of mnfrs. of and dlrs. in tea, coffee, cocoa and other food beverages, etc. Nom. Cap.: £2,000. Dir.: H. H. Wollstein, 9, Lancaster Road, N.W. 3.

Cyril and Alfred Walkling (East Ham), Limited. 156, Katherine Road, East Ham, E. To take over the bus. of bakers and confectioners cd. on at 245, High Street North, East Ham, and elsewhere. Nom. Cap.: £10,000. Dirs.: A. Walkling, Dunotton, 26, Monkhams Drive, Woodford Green, and A. C. Walkling, 4, The Crescent, Cranbrook Park, Ilford.

Denny's (Butter), Limited. Hibernia Chambers, London Bridge, S.E. 1. To acquire the goodwill and assets of the business of factors and blenders of butter and cheese, etc., cd. on by E. M. Denny and Co., Ltd., at 9-19, Juxon Street, S.E. Nom. Cap.: £60,000. Dirs.: Not named. Remun. of dirs.: As voted by the company. Subs.: J. R. Beckensall, 29, Alwyne Villas, Canonbury, N. 1, and J. E. Barrier, 73, Baldry Gardens, S.W. 16.

Glaxo Laboratories, Limited. To take over the bus. cd. on by the Glaxo Department of Joseph Nathan and Co., Ltd., at 56, Osnaburgh Street, N.W. 1, and elsewhere, and to carry on bus. as dlrs. in and mnfrs. of milk products, etc. Nom. Cap.: £400,000. Subs.: A. Nathan, 16, St. Helens Place, E.C. 3, and H. Jephcott, 56, Osnaburgh Street, N.W. 1.

Preservators, Limited. To enter into an agreement for the acquisition of the rights and interest of the International Corporation, Ltd., in a certain agreement, and to carry on the bus. of foodstuff preservation, etc. Nom. Cap.: £3,000. Dirs.: H. Heather, 19, Kidderpore Avenue, N.W. 3 (permt. ch.); A. Ryner, 3, Grosvenor Gardens, S.W. 1; W. H. Fawkes, address not stated.

Sorensen and Gerrard, Limited. 80, Henry Street, Liverpool. To take over the bus. of yeast, bakers' sundries, and bakers' machinery mchts. and exporters cd. on at Liverpool as "R. Sorensen and Co." Nom. Cap.: £2,000. Permt. dirs.: R. R. Sorensen, 4, Clarendon Road, Manchester; W. C. Gerrard, 80, Henry Street, Liverpool.

Wilfred Moss and Company, Limited. To take over the bus. of sugar boilers and sweetmeat mnfrs., bakers, etc., cd. on by W. Moss and Martha A. Shorrocks at Merehall Works, Boocroft Street, Bolton. Nom. Cap.: £1,500. Permt. dirs.: W. Moss, 34, Brownlow Road, Horwich; Mrs. M. A. Shorrocks, same address.

The above-mentioned particulars of new companies recently registered have been extracted from the daily register of Messrs. Jordan and Sons, Ltd., company registration agents, Chancery Lane, W.C. 2.

RECENT TRADE MARKS

This list of Trade Marks of interest to readers has been selected from the "Official Trade Marks Journal", and is published by permission of the Controller of H.M. Stationery Office. The "Trade Marks Journal" can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

BARONESS.—561,004. **Margarine, butter, bacon, hams, tinned fruits, tinned fish, tinned meats, and tea.** PEEK BROS. AND WINCH, LTD., 20, Eastcheap, London, E.C. 3. October 23.

Registration No. 301,971 (1581) will be cancelled if and before the applicants' mark is registered.

CHEF.—561,859. **Canned articles of food in the form of rolls consisting of or containing meat, fruit, fish, jam, marmalade, preserves, syrup, vegetables, chocolate, or mincemeat.**

CHEF PRODUCTS, LTD., 20, Soho Square, London, W. 1. November 13. (Associated.)

Registration of this trade mark shall give no right to the exclusive use, either separately or in combination, of the roll device and the word "Chef".

CHOCWELL. — 562,521. **A chocolate flavouring for food and beverages (not alcoholic).** GOODWIN TIDSWELL, LTD., Atlas Works, Carnarvon Street, Cheetham, Manchester, 3. November 6.

CITY AND PROVINCIAL. — 561,633. **Substances used as food or as ingredients in food.**

THE CITY AND PROVINCIAL STORES, LTD., trading also as City and Provincial Stores, Atlantic Mills, Droylsden Road, Newton Heath, Manchester, 10. November 13. (Associated.) (By Consent.)

CORDORO.—562,881. **Paste (for food) dough and pastry.** J. P. MARSHALL, LTD., 150, Copland Road, Govan, Glasgow. October 30. (Associated.)

D. M. P.—B 559,808. **Milk powder (for food).**

DRIED MILK PRODUCTS, LTD., Dominion Buildings, 2, South Place, London, E.C. 2. October 30.

User claimed from January 1, 1930.

The applicants undertake that this mark, and the trade marks Nos. 558,565 (3000) and 559,521 (2996) shall be assigned or transmitted only as a whole and not separately.

EXCELDA.—562,335. **Flour.** CO-OPERATIVE WHOLESALE SOCIETY, LTD., 1, Balloon Street, Manchester. October 9. (By Consent.)

FARMERS' GLORY.—563,389. **Food products prepared from wheat.** FARMERS' GLORY, LTD., The Mill, Huntingdon. November 13. (Associated.)

Registrations Nos. 540,188 (2878) and 546,491 (2914) will be cancelled if and before the applicants' mark is registered.

FARMERS' GLORY. — 563,390. **Toasted wheat flakes for food.**

FARMERS' GLORY, LTD., The Mill; Huntingdon. November 13. (Associated.)

Registration of this trade mark shall give no right to the exclusive use, either separately or in combination, of the map device, the device of an ear of corn and the devices of wheatsheaves.

Registrations Nos. 540,188 (2878) and 546,491 (2914) will be cancelled if and before the applicants' mark is registered.

FOREST.—559,570. **Canned fruit—namely, peaches, apricots, pears, plums, raspberries, strawberries, damsons, loganberries, black currants, red currants, cherries, and gooseberries.** GEORGE PAGE AND SONS, LTD., Ogle Road, Southampton. November 13. (Associated.) (By Consent.)

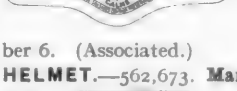
GLIDER.—563,316. **Dried fruits, nuts for food, and dates.** BARROW, LANE AND BALLARD, LTD., Pudding Lane, London, E.C. 3.

GOLDEN HIND. — 563,184. **Substances used as food or as ingredients in food, but not including grapefruit and not including any goods of a like kind to grapefruit.** SALTER AND STOKES, LTD., 19-20, King Street, Snow Hill, London, E.C. 1. October 23.

GOLDETTES. — 561,471. **Canned grapefruit.**

FLORIDA-GOLD CITRUS CORPORATION, corner of Lee-Jackson Highway and Glencruitten Avenue, Lake Alfred, Polk County, Florida, United States of America. November 13. (By Consent.)

HARRIS.—562,234. **Sausages.**



C. AND T. HARRIS (CALNE), LTD., 1, The Strand, Calne, Wiltshire. November 6. (Associated.)

HELMET.—562,673. **Margarine.**

WESTERN MARGARINE, LTD., Alliance Factory, Western Avenue, Acton, London, W. 3. October 30. (Associated.)

HERCULAN. — 563,261. **Beverages not containing yeast (not alcoholic, not aerated, and not medicated).** AMYLON, LTD., Haymerle Works, Haymerle Road, Peckham, London, S.E. 15. November 6.

HITCHMAN'S. — 553,471. **Milk, cream, eggs, tinned fruits, tinned vegetables, and jam.**

HITCHMAN'S DAIRIES, LTD., 139, Hoe Street, Walthamstow, London, E. 17. October 23. (By Consent.)

Registration of this trade mark shall give no right to the exclusive use of the word "Hitchman's".

IMPEX.—560,514. **Vegetables (for food) and fruits.**

HERMAN LUTTMER, 3, The Piazza Chambers, Covent Garden, London, W.C. 2. October 30. (By Consent.)

KING GUSTAF. — 562,378. **Brisling.** STRÖMSTAD CANNING COMPANY, Aktiebolaget, Stadsägan 17-19, Strömstad, Sweden. October 30.

MARCOLENE.—561,195. **Lard compounds for use as food.** G. W. MARSDEN, LTD., Firth Street, Huddersfield. October 23.

MERRIMEAD. — 562,411. **Tea, coffee, cocoa, chicory; canned or potted meat, fish, fruits, and vegetables (for food).** T. SEYMOUR MEAD AND CO., LTD., St. George's Hall, Upper Medlock Street, Manchester. November 6.

MOOROVIT. — B 558,525. **Self-raising flour.** ALFRED THORNE, Two Counties Mill, Eaton Bray, Dunstable. August 28.

User claimed from May 2, 1929.

OLD FOLKS.—560,166. **Tea, coffee, coffee extract, coffee essence, cocoa, chocolate, and confectionery.** THE MAZAWATTEE TEA COMPANY, LTD., 12, Tower Hill, London, E.C. 3. October 23. (Associated.)

PANSANO.—562,224. **Bread and cereal products (for food).** FACTORS, LTD., Ferry Buildings, Quay Street, Auckland, New Zealand. November 6. (By Consent.)

PARACHUTE.—563,361. **Lard for food.** BACON EXPORT GNIEZNO SPOLKA AKCYJNA, 55, Gdansha, Bydgoszcz, Poland. November 13.

PATRICIA. — 562,389. **Canned fruits, canned vegetables, canned fish, and dried fruits.** HENRY W. PEABODY AND CO., OF LONDON, LTD., 16, Eastcheap, London, E.C. 3. October 30.

PELICAN.—560,001. **Singapore pineapples.**

HENRY W. PEABODY AND CO., OF LONDON, LTD., 16, Eastcheap, London, E.C. 3, and PATERSON, SIMONS AND CO., LTD.,

London House, Crutched Friars, London, E.C. 3. November 13. (Associated.)

Registration of this trade mark shall give no right to the exclusive use of the device of a pineapple.

Pineapples and goods of a like kind will be struck out from the goods of Registration No. 271,173 (1413) if and before the applicants' mark is registered.

P. F.—561,604. **Biscuits.** PEAK, FREAN AND COMPANY, LTD., 158, Drummond Road, London, S.E. 16. November 6.

Registration of this trade mark shall give no right to the exclusive use of the letters "P. F."

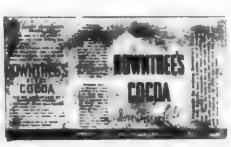
PREMIER. — B 558,601. **Wafer biscuits and edible containers for ice-cream.** The firm trading as "ASKEY'S," 290, Kensal Road, London, W. 10. October 23.

User claimed from January 10, 1912.

RED KING.—560,082. **Preserved, canned, bottled, and dried fruits.** S. AND W. BERISFORD, LTD., 20 and 22, Withy Grove, Manchester. November 6. (Associated.)

REDRHYNO. — 561,526. **Fruit.** VIOLET ROBERTSON BROWN, "Redrhyno" Fruit Farm, Port Shepstone, Natal, Union of South Africa. October 30.

ROWNTREE'S COCOA.—562,902. **Cocoa.** ROWNTREE AND CO., LTD., The Cocoa Works, Wigginton Road, York. October 30. (Associated.)



SAUVITE. — 563,544. **Sausage meal.** SPENCE AND CO., LTD., 1, Back Barnard Street, Darlington. November 13.

SEAPOWER.—563,026. **Edible oils and edible fats.** BALLOCHMYLE CREAMERY CO., LTD., 4, Water Street, Tudor Street, London, E.C. 4. October 23.

SEASPRAY.—563,027. **Margarine.** BALLOCHMYLE CREAMERY COMPANY, LTD., 4, Water Street, Tudor Street, London, E.C. 4. November 13. (Associated.)

SUNDETTE. — 562,667. **Wafer biscuits and shaped biscuits for containing ice-cream.** ASKEYS PREMIER BISCUIT CO., LTD., 290, Kensal Road, London, W. 10. November 6.

SUNIN.—562,337. **Flour, bread, biscuits, and cereal foods.** THE NATURAL FOOD COMPANY, LTD., 210, 212, and 214, Cambridge Road, London, E. 2. October 2.

TEDO.—562,046. **Substances used as food or as ingredients in food.** EDWARD LAWRENCE FROST, 23, Warwick Street, Worthing, Sussex. September 11.

THE GOLDEN DROP.—561,522. **Olive oil (for food).** The firm trading as HENDERSON, HOGG AND CO., 17, Cadogan Street, Glasgow, C. 2. August 21.

Registration of the trade mark shall give no right to the exclusive use of the words "The Golden Drop".

THEOMEAL.—563,016. **All goods in Class 42, which includes substances used as food or as ingredients in food.** PARKIN PROPRIETARIES, LTD., The Dashwood Trading Estate, Larch Road, Balham, London, S.W. 12. October 23.

THIRQUEN.—561,683. **Substances used as food or as ingredients in food.** JAMES BROTHERS AND SONS, LTD., Albion Works, 14 to 22, Commercial Street, Northampton. August 21.

TITANIC.—B 561,062. **Flour.** J. AND H. ROBINSON, LTD., Deptford Bridge Mills, London, S.E. 8. August 21.

User claimed from December 31, 1918. Section 21.

The applicants undertake that this mark, when registered, and the marks Nos. 559,736 (2994) and B 561,134 (2994), shall be assigned or transmitted only as a whole and not separately.

TITLE.—562,742. **Tea.** GEORGE EDWARD BALDRY, 10, Corn Market, Worcester. October 2.

TOWN TALK.—560,917. **Canned fruits.** F. M. BALL AND CO., 112, Market Street, San Francisco, California, United States of America. October 23.

(Associated.)

TRESCA.—559,277. **Condensed milk and cream.** CLEEVES, LTD., Cleevedale Park, 44, South Side, Clapham, London, S.W. 4. August 28.

TRYPEX.—562,414. **Lard compounds for food, shortenings (being edible fats), and cooking fats.** WESTERN MARGARINE, LTD., Alliance Factory, Western Avenue, Acton, London, W. 3. September 25. (Associated.)

TYLANDO.—561,796. **Tea.** ROBERT JOHN NEWMAN GRAY, Greycroft, Hallow Road, Worcester. August 21.

VELTONE.—561,774. **Canned fruits, fish, and vegetables (for food).** HENDERSON AND LIDDELL, LTD., 15, Eastcheap, London, E.C. 3. August 31.

VUVU. — 561,368. **Substances used as food or as ingredients in food, but not including canned meats, canned fish, canned vegetables, or canned fruits, and not including any goods of a like kind to any of these excluded goods.** The firm trading as BIBBY'S, 9, Sandland Street, Bedford Row, London, W.C. 1. September 4.

"WEE GEORGIE" BRAND.—558,079. **Canned fish.** THOMAS MCCONNELL, Botolph House, 10, Eastcheap, London, E.C. 3. August 21. (Associated.)

ZAVO.—561,840. **Substances used as food or as ingredients in food.** F. W. HAMPSHIRE AND CO., LTD., Sunnydale Works, Sinfin Lane, Derby. August 21.

558,777. — **Wheatmeal, and stone-milled flour, biscuits made from wheatmeal and stone-milled flour, charcoal biscuits, bran biscuits, and bran for use as a breakfast food.** R. M. SCOTT (IPSWICH), LTD., 34, Turret Lane, Ipswich. June 26.

559,343.—**Substances used as food or as ingredients in food.** EXCEL CO., LTD., 50 and 52, St. John Street, London, E.C. 1. August 7.

559,459 —**Jams, marmalade, mincemeat, bottled fruits, and lemon cheese.** F. DUERR AND SONS, LTD., Prestage Street, Ayres Road, Old Trafford, Manchester, 16. July 31.

560,215. — **Condensed milk and milk-powder (for food).** LIJEMPF (LEEUWARDER IGS EN MELK PRODUCTEN FABRIEKEN) NAAMLOOZE VENNOOTSCHAP, Potmarge, Leeuwarden, The Netherlands. July 31.

560,368.—**Ice cream.** THE SWAN FOOD PRODUCTS CO., LTD., 264a, High Road, Chiswick, London, W. 4. August 14.

Ice-cream powders will be struck out from the goods of Registration No. 302,288 (1597) if and before the applicants' mark is registered.

560,440.—**All goods in Class 42, which includes substances used as food or as ingredients in food.** CARNATION MILK CO., LTD., 52 to 54, Gracechurch Street, London, E.C. 3. August 14.

Registration No. 447,755 (2432) will be cancelled if and before the applicants' mark is registered.

560,454.—**Rice and rice bran (for food).** W. R. LOXLEY AND CO. (LONDON), LTD., 106, Fenchurch Street, London, E.C. 3. July 10.

The applicants undertake not to use the cross device in red, or in white on a red ground, or in any similar colour or colours.

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The flavour of bread depends largely upon correct fermentation of the dough.

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controls fermentation as it should be controlled helping the Baker to obtain uniformity of flavour, batch after batch, day after day. When the flavour is always good, people

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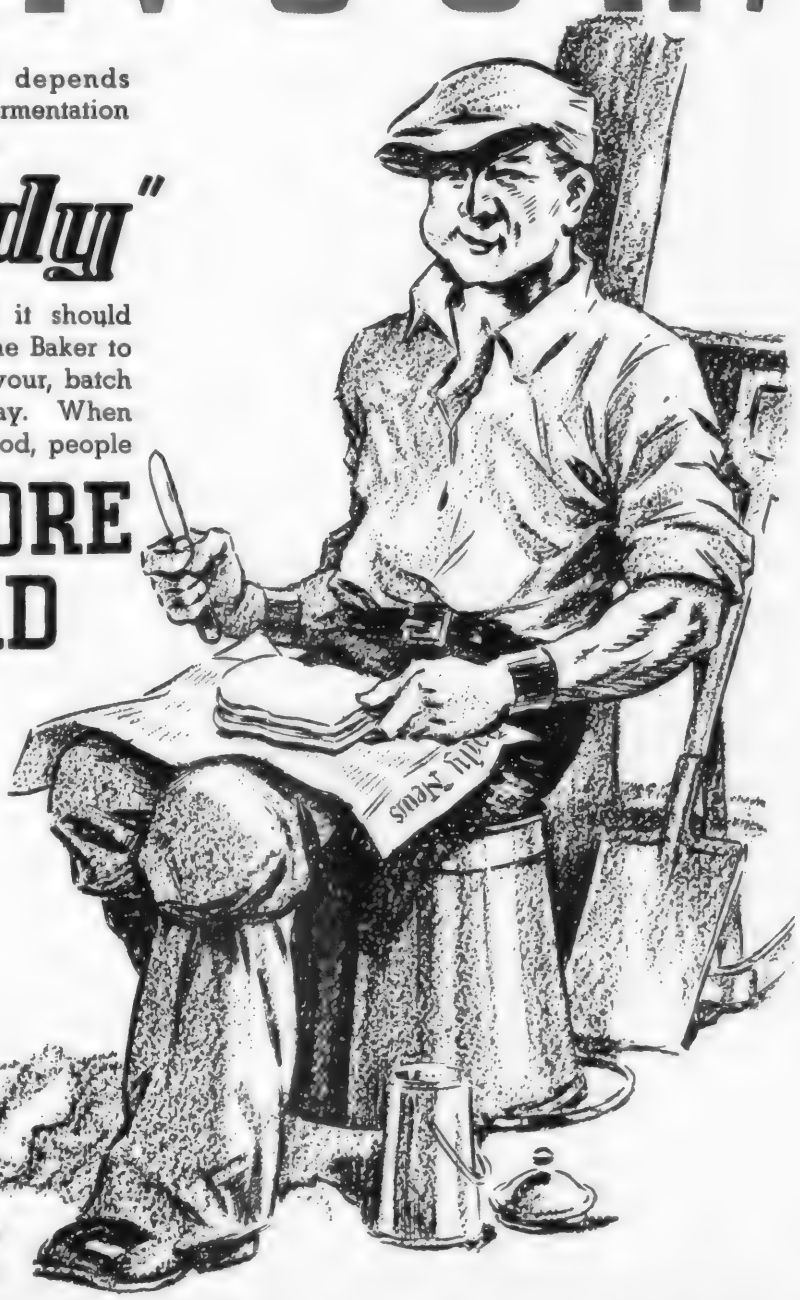

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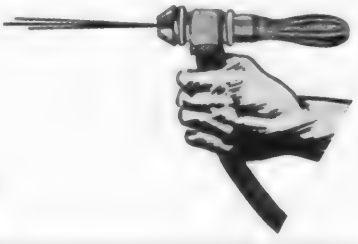

LAYCOCK ENGINEERING COMPANY
VICTORIA WORKS, MILLHOUSES, SHEFFIELD, 8

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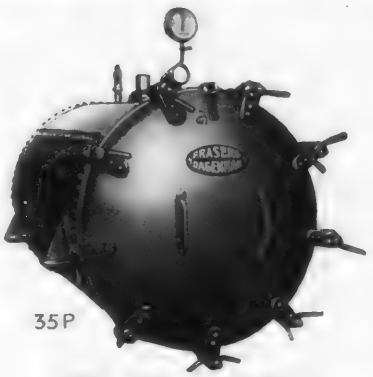

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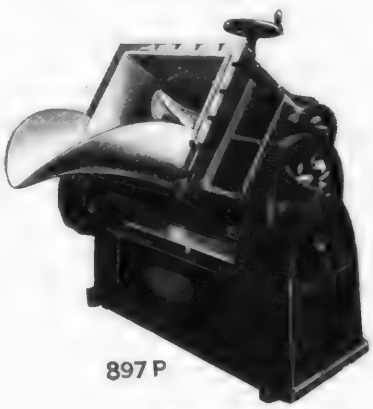

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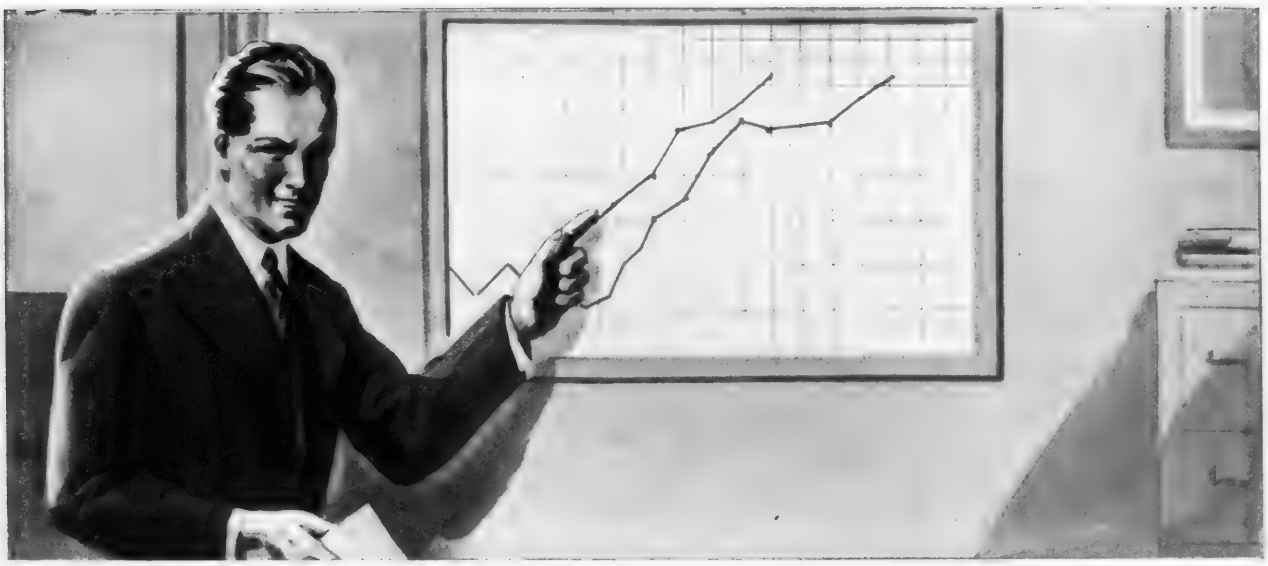

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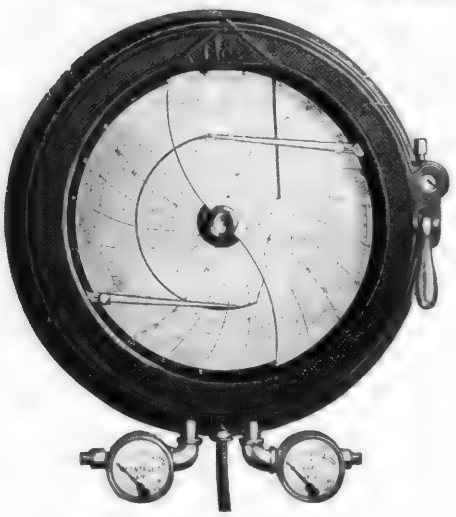

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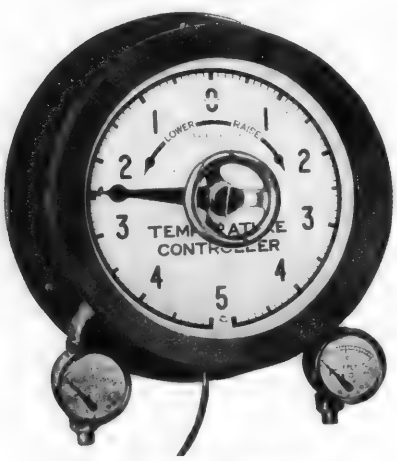

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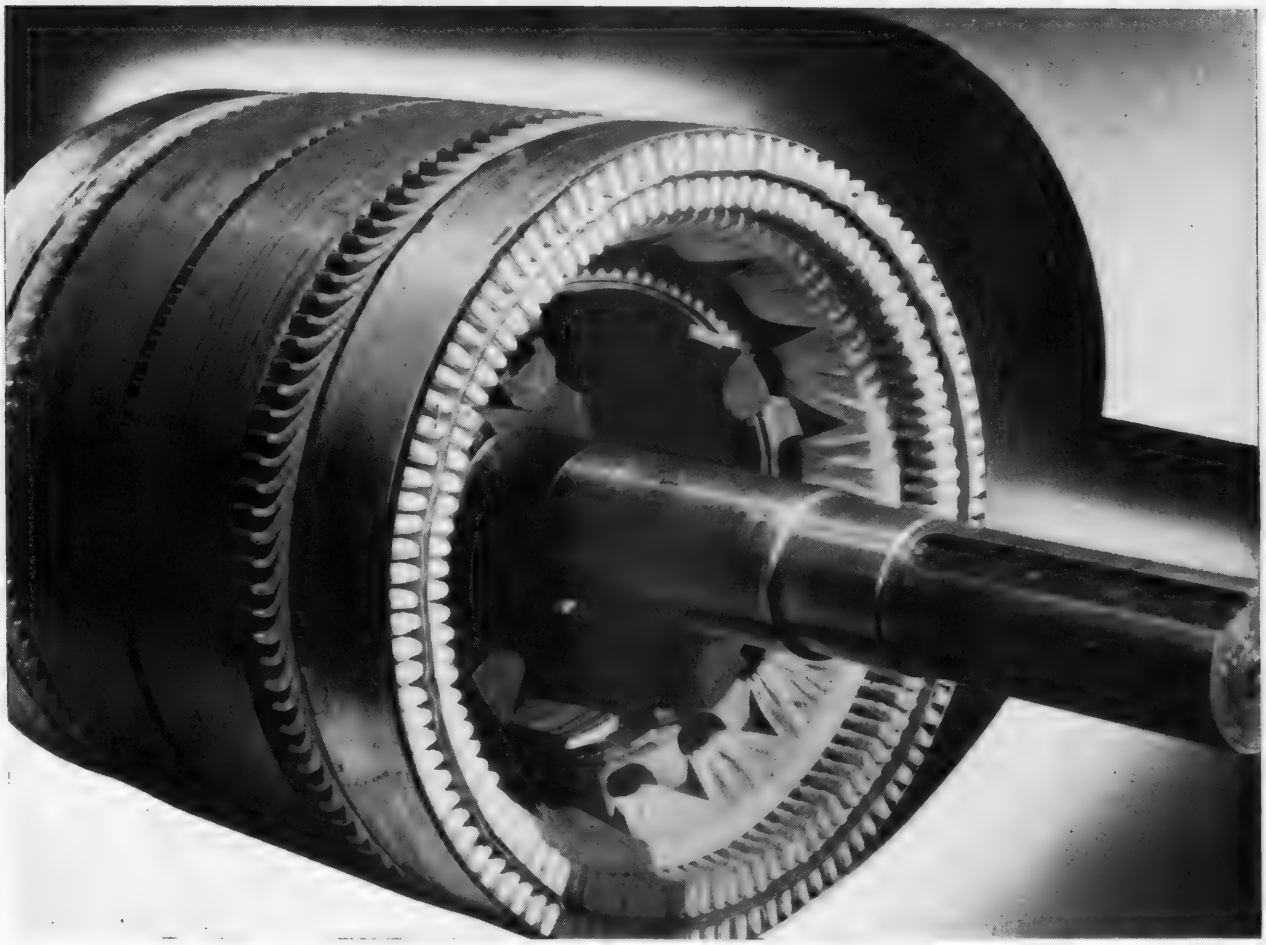

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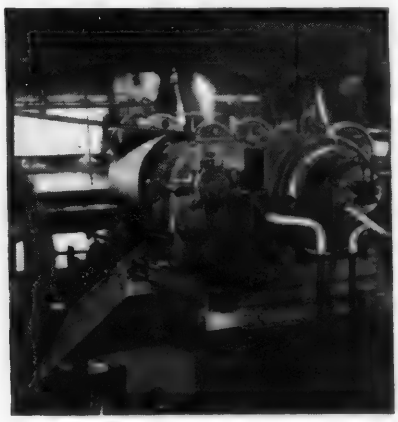

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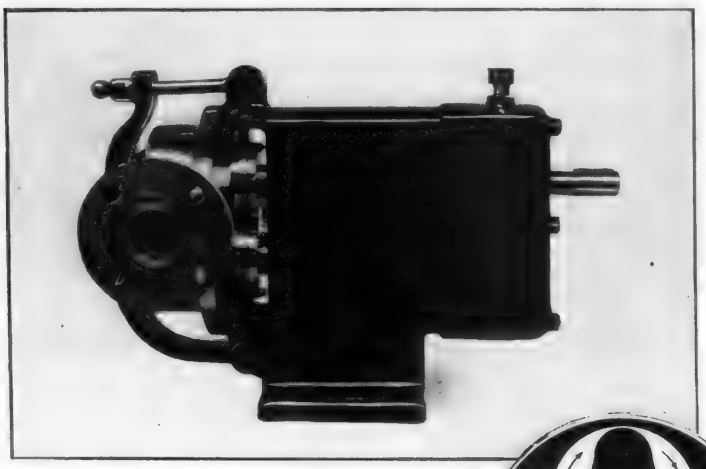

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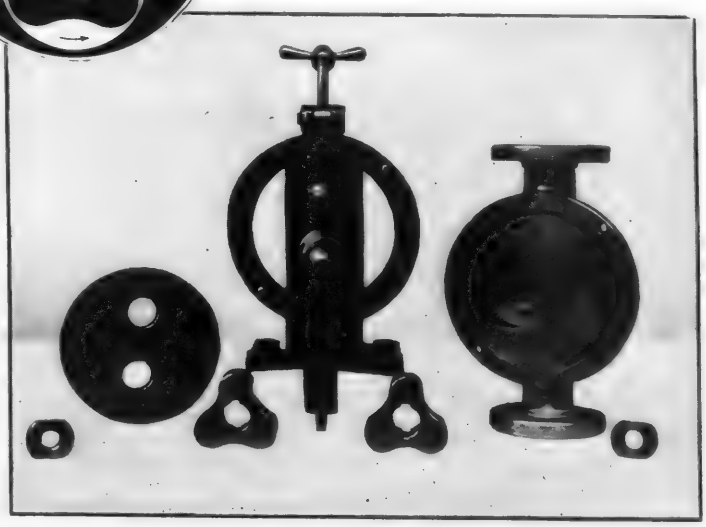

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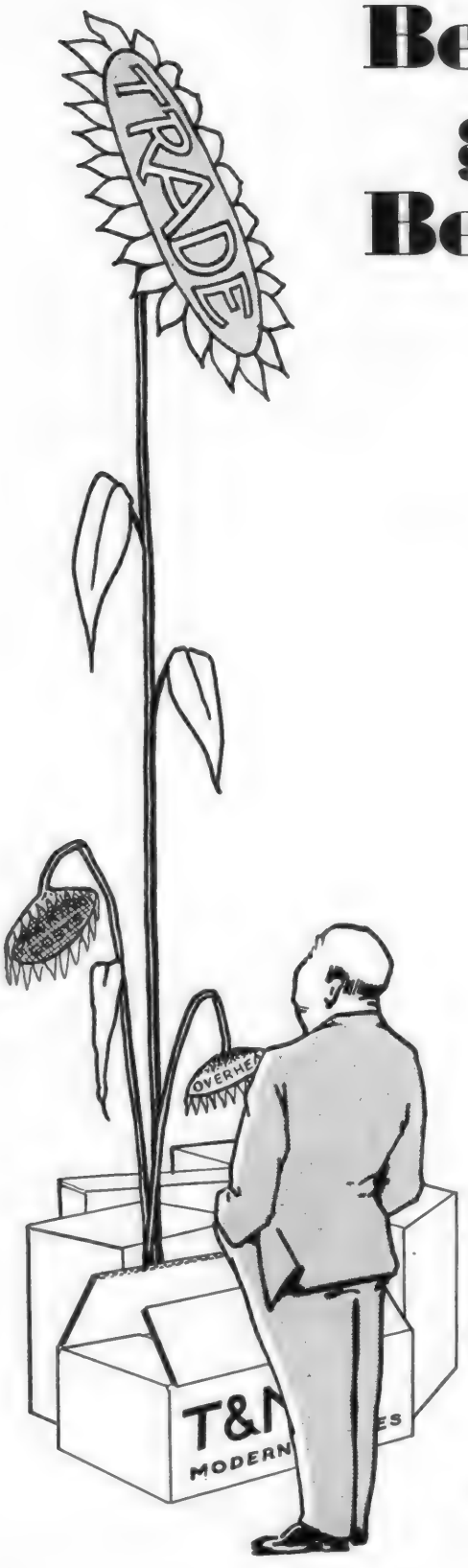

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In addition, it attracts the retailer's co-operation; it is the type of package he likes—light-weight, non-returnable, clean and space saving.

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The THOMPSON & NORRIS Mfg. Co. Ltd.

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Scottish Factory: Corstorphine, Edinburgh.
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He likes this range

—BETTER FLAVOURED FOOD
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So does the shopkeeper

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So does the fabricator

—EASIER TO WORK
("SILVER FOX" IS DEFINITELY MORE DUCTILE)

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NEW PROCESS

STAINLESS STEELS

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"Silver Fox" is readily bent, shaped, drawn, soldered or welded—uniform in composition throughout (not just a surface finish)—hygienic, durable and long lasting.

Write for Catalogue SF.157 to Publicity Dept., 17, Westbourne Road, Sheffield, 10.

THE UNITED STEEL COMPANIES LTD

SAMUEL FOX & CO. LTD., STOCKSBRIDGE, NR. SHEFFIELD

Associated with The United Steel Companies Limited

F.103

For PRODUCING FINE *and* SUPERFINE POWDERS

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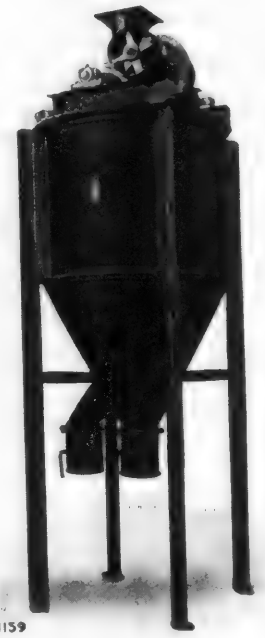
BRITISH REMA

High Efficiency Air Separators

(Patented—further patents pending)



BR. 1159

- Easily adjusted to produce any fineness from 100 mesh to 325 mesh.
- Sharp classification.
- No screens, no filter bags.
- Air circulation internal, no relief vents required.
- No dust emission, machine totally enclosed.

  10 sizes, 50 lbs. to 2,500 lbs. per ton.
- Low power consumption, 1 h.p. per ton.

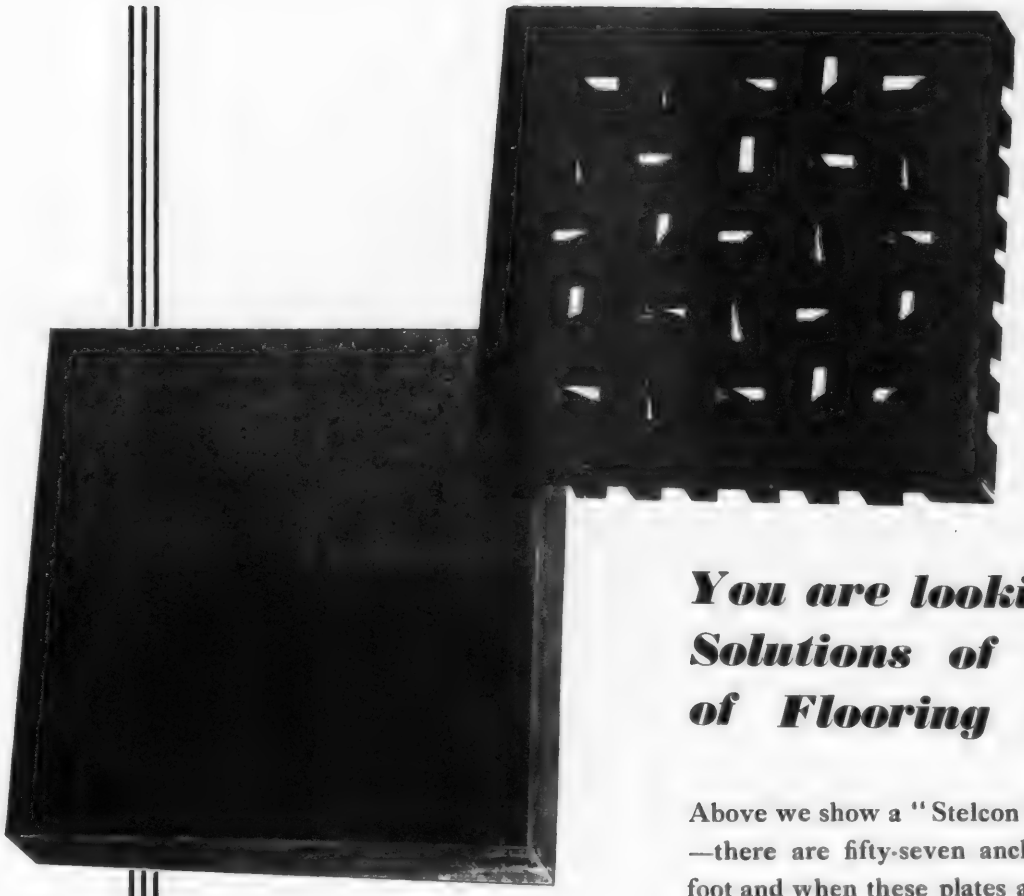
SCRAP YOUR SCREENS, SIFTING REELS AND DRESSERS, AND FIT THE CLEANEST AND MOST EFFICIENT CLASSIFIER OBTAINABLE.

Send for particulars, or better still come and see your own material put through our demonstration machines.

THE BRITISH REMA MANUFACTURING Co. Ltd.

Park Works, Halifax, England

BIF 1936 BIRMINGHAM ENGINEERING AND HARDWARE SECTION SEE OUR EXHIBIT



You are looking at the Solutions of hundreds of Flooring Problems

Above we show a "Stelcon" Anchor Steel Plate —there are fifty-seven anchors to each square foot and when these plates are laid on concrete every anchor grips and so provides an immovable, dustless, all-steel floor of very great durability.

The lower illustration shows a "Stelcon" Steel Clad Flag. These flags are made of very highly compressed concrete and have a specially constructed steel face so that they are dustless, practically non-absorbent, and capable of withstanding really heavy abrasive wear. The Flag illustrated was taken from a run-way after seven years' use and found to have worn less than $\frac{1}{32}$". The top half has been polished to show that no disintegration has taken place.

Either or both of these products can give you very great service by eliminating maintenance costs and showing important savings in many other interesting directions, details of which will gladly be sent upon request.

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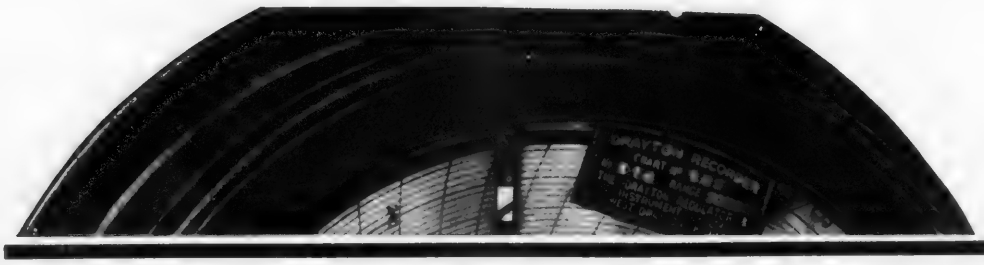
"Stelcon" FOR INDUSTRIAL FLOORS

BEST WHERE CONDITIONS ARE WORST



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Drayton manufacture a complete range of boiler house and heat process instruments and would be glad to tender for all such requirements, including complete control panels, flow meters, etc.

Quality is not always a matter of appearance. This is particularly the case with recorders. Handsome appearance, polished plate and immaculate enamel are poor substitutes for close accuracy, sensitivity and, above all, *reliability*.

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WEST DRAYTON MIDDLESEX

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Give us your specification and we will submit a sample box. Your order will then be marked for "Green Arrow" service and will go through in record time.

Medway Corrugated Boxes are specially designed for packing fragile and brittle articles. They are collapsible and easily stored—and British throughout.

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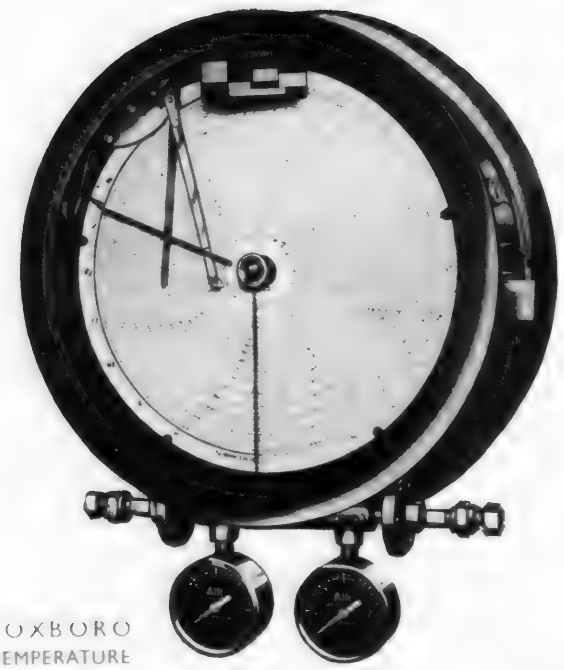

FOXBORO
TEMPERATURE
CONTROLLERS
Write for Bulletin
No. 177-1

Nothing left to chance!

IN cooking retorts absolute control of temperature is vital in obtaining economy and uniform results. To meet this, Foxboro have designed a temperature controller so accurate that it will operate on a change of temperature of ONE QUARTER OF ONE DEGREE. This is due to the sensitivity of its temperature element, to the flex of air operation and to its accurate calibration in degrees. It is not a "hotter-colder" device but a definite temperature control leaving nothing to chance.

It is made entirely of metal and is guaranteed for accuracy and good workmanship.

That leading manufacturers use it proves its value and efficiency.

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Best Best Charcoal : "Eagle."
"Crayfish" Special.

THE Baldwin range includes a branded Tinplate for every purpose. These Tinplates are STANDARD brands regularly used in all parts of the world for every kind of canning and deep stamping work.

As the original makers of Open Hearth Siemens Basic Steel with complete control of materials from iron ore to finished product, Baldwins are able to offer exceptional advantages to users of Tinplate.

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Stainless Steel Liner for Jacketed Vessel.

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KELLIE'S

Latest Improved Hydro-Electric Continuous

WASHING MACHINE

ONE *of your production costs can be* **REDUCED**

- As a Food Manufacturer one of your problems to-day is to give a little better value than your competitors—in other words, to reduce your production costs.
- Take Biscuit Manufacture for instance.
- One of the important items in cost of manufacture is the Washing and Sterilising of empty return Biscuit Tins and the simultaneous removal and separation of old labels.
- Consider what these operations are costing *you*.
- How do they compare, for instance, with a KELLIE Type 10.JJ Hydro-Electric Continuous Washing and Sterilising Machine with patent rotary extractors for separating, removing and ejecting labels ?
- Employing only four girl operators, this machine deals with 10,000 9 in. × 8½ in. × 9½ in. Biscuit Tins per day, removes all labels and produces a perfectly clean and bright Tin without any harmful effect to the tinning.
- In over 100 instances the savings effected by the machine are sufficient to clear its cost in nine to twelve months working.
- Need we say more ?

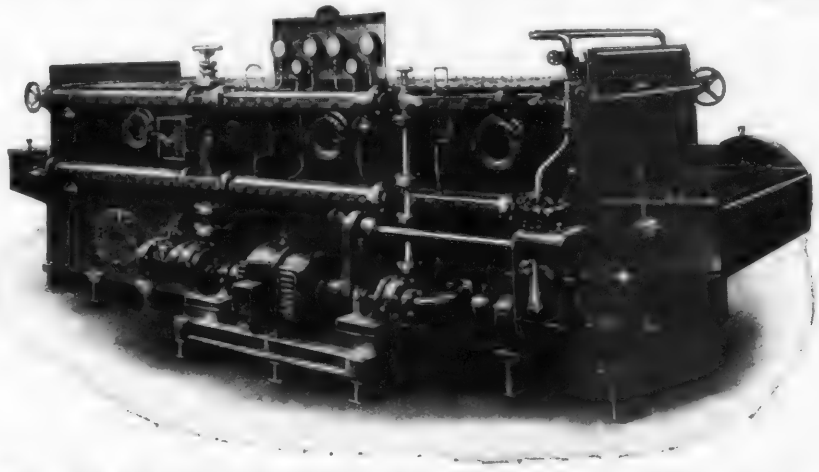
Installed by Leading Food Manufacturers
for continuously washing and sterilising all types and sizes of open-mouth Containers up to and including 16 inches in height.
No stopping to change from one size of Container to another. Specially adapted for washing and thoroughly cleansing the dirtiest class of returned jam jars, as well as new glass and stone jars.

SPECIAL FEATURES

Patent Rotary Filter Screens which automatically remove labels from rinsing and detergent water and eliminate pulping.
No brushes, no breakages and no jar drier required.
No trouble whatever. Perfect results in every case.

Also used for :

BAKERS' BOARDS,
BISCUIT TINS,
TRAYS and RACKS.
CONFECTIONERY, MILK
and FRUIT BOTTLES.
LEMON CURD,
MINCEMEAT & MALT JARS.
PUDDING BOWLS.
PEAR-SHAPED
HAM CONTAINERS.
TONGUE and BRISKET
MOULDS and CONTAINERS,
CHOCOLATE MOULDS,
ICE CREAM MOULDS,
Etc., Etc.



Our latest Hydro-Electric Machine with patent label extracting arrangement cleans 30,000 2-lb. Dirty Return Jam Jars Daily with four operators, and compared with handwashing costs, pays for itself within twelve months. Can you afford NOT to instal it ?

- Why not investigate its possibilities in your Plant ? Send full particulars of your Containers and output required to:—

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. . . . *the fastest*

LABELLING MACHINE

of its kind . . . .

The "Westminster" Labelling Machine

This is the fastest machine of its kind ever built—it will label all standard sizes of cans with double-seamed ends just as fast as it is possible to feed them, either by hand or mechanically.

It uses hot or cold pick-up adhesive, the paste-pot is air-tight and the paste recirculates, eliminating waste and mess.

It is automatically controlled. A jam-up immediately disconnects the motor and stops the machine until it is cleared. It can be stopped from either end, and a warning light gives a signal for replenishment of the label box.

Equipped with ¼-H.P. motor to plug into electric light circuit. Quickly adjustable for different sizes of cans. Labelling positive, straight and tight. A splendidly built engineer's job.

For further particulars write

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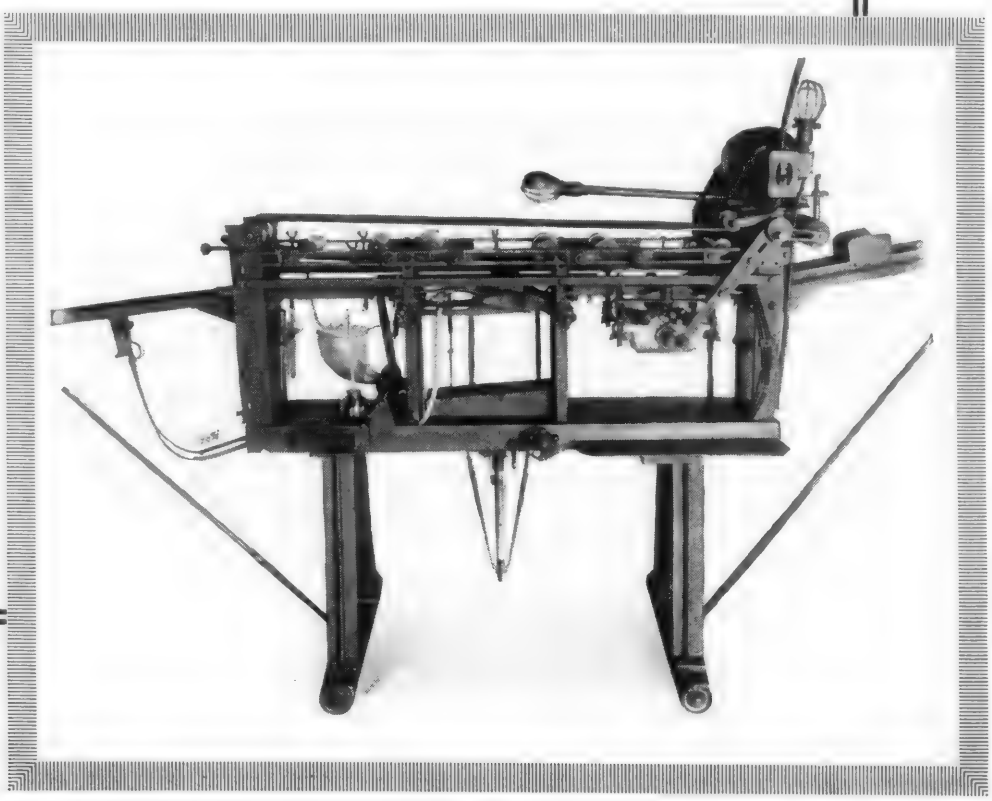
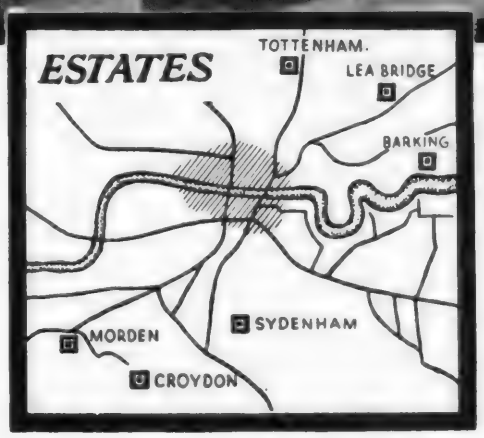


THE HANDICAP



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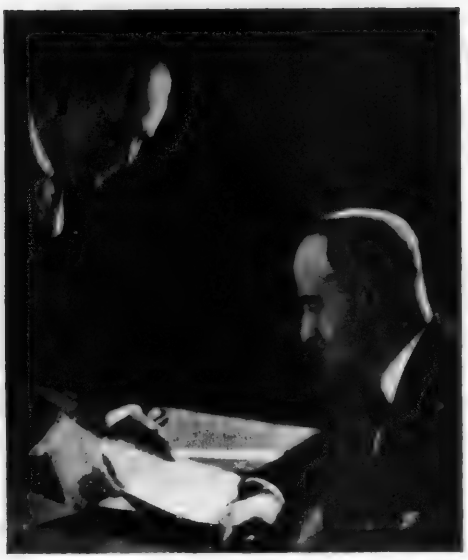

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"It's been a wonder—that first Gardner Patent Combined Dressing, Spraying and Mixing Machine—for the consistent way it's done three jobs at once, each once better than we'd thought possible.

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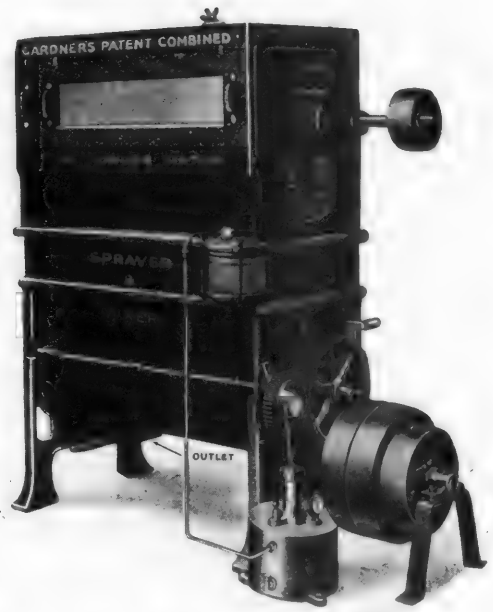

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Patent "RAPID" DRESSING MIXING & SPRAYING MACHINE"

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Compressors of this type are built with two, three or four cylinders, are provided with a reliable system of forced lubrication, and are suitable for direct coupling to electric motors, steam or internal combustion engines or for driving by means of multiple V belts. The range of outputs covered extends from 28,000 B.T.U./per hour to 12,000,000 B.T.U./ per hour.

YOU CANNOT BETTER A **J. & E. HALL COMPRESSOR**

For Efficiency, Reliability in operation and Economy in maintenance costs.

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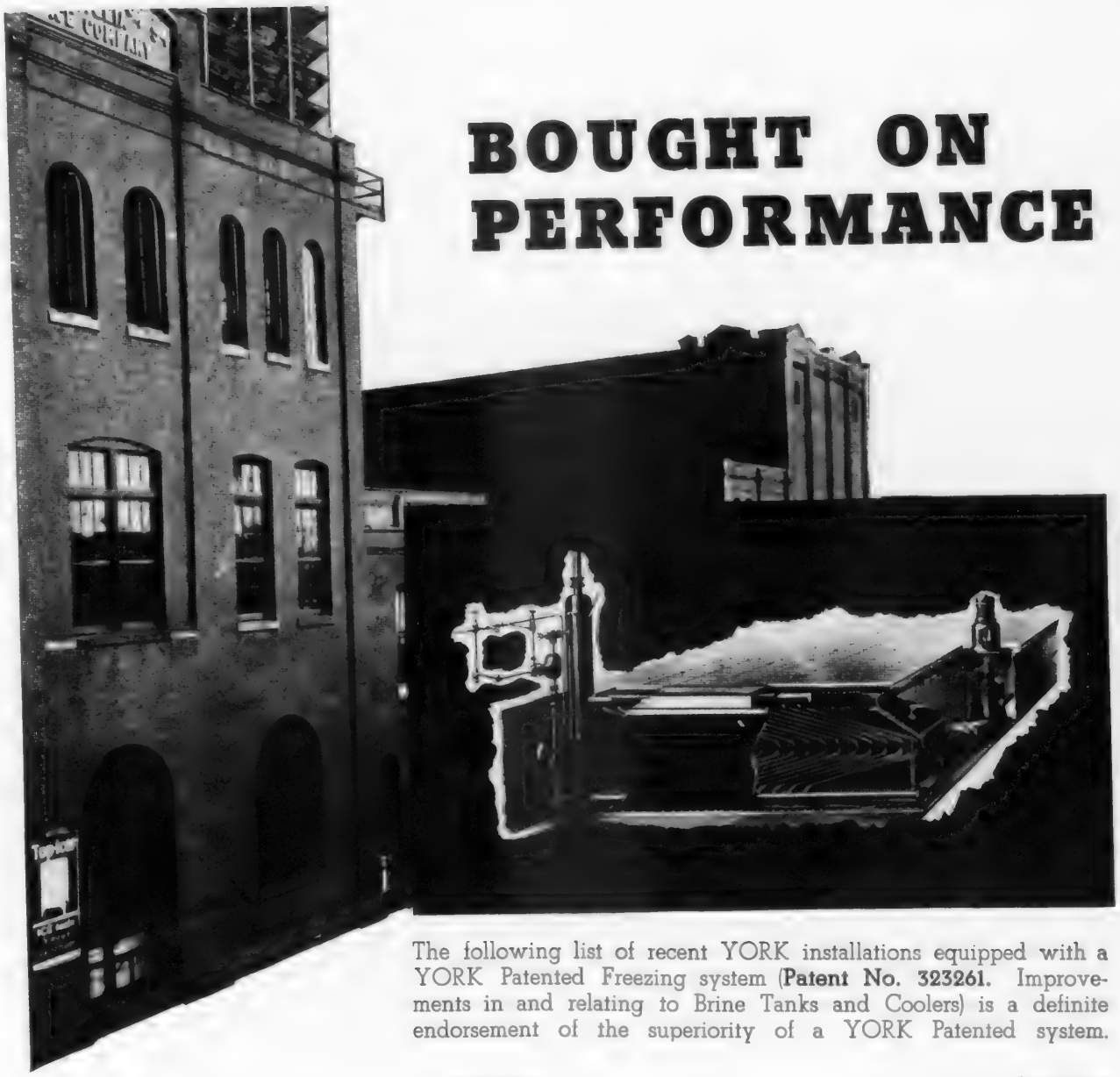

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C. & T. Harris (Calne) Ltd.	140 „
Nottingham Co-op. Society Ltd ..	50 „
Express Dairy Co. Ltd.	
Cricklewood	100 „
Farringdon	60 „
Bolo Lane	60 „
Rowsley	60 „
Seaton	60 „
Appleby	80 „

	Refrigerating Capacity
Leeds Co-op. Society Ltd.	20 tons
Grosvenor House (Park Lane) Ltd. London	100 „
C.W.S. Milk Depot, Fole, nr. Uttoxeter	100 „
Mars Confections, Slough	100 „
Kodak Ltd. London	300 „
North Staffs. Co-op. Dairy	75 „
Gervais, France	50 „
Midland Counties Dairies, Birmingham	100 „

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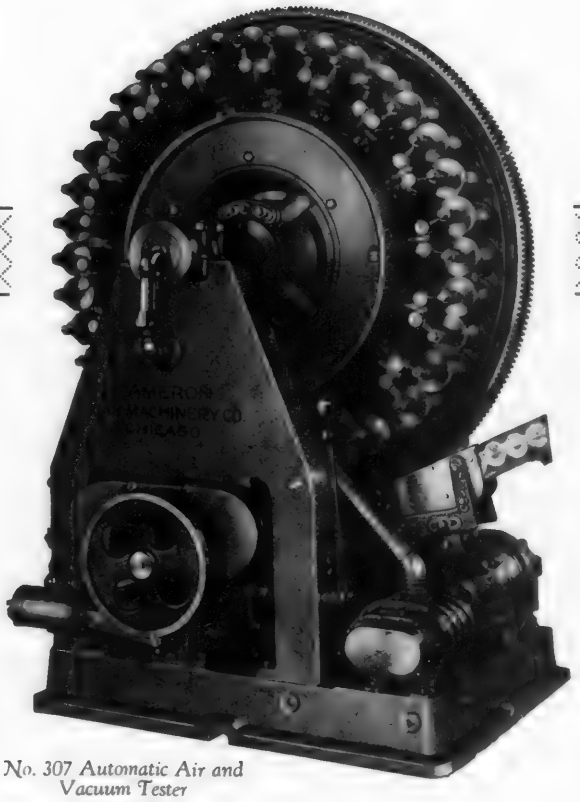
BRANCHES IN ALL PRINCIPAL CENTRES.

REFRIGERATION YORK AIR CONDITIONING



No. 307 Automatic Air and Vacuum Tester
(Patented)

Know the

• CAMERON •

CAN TESTER

One customer now has eight of these Testers.
Another customer has six.
Three others each have three.
Two others each have two.
Seven customers each have one.

•

REPEAT ORDERS
BESPEAK
SATISFACTION
and
DEPENDABILITY

The cans are not immersed in water.

This modern machine automatically tests and separates imperfect cans from good ones.

Output, three hundred cans per minute.

No operator required.

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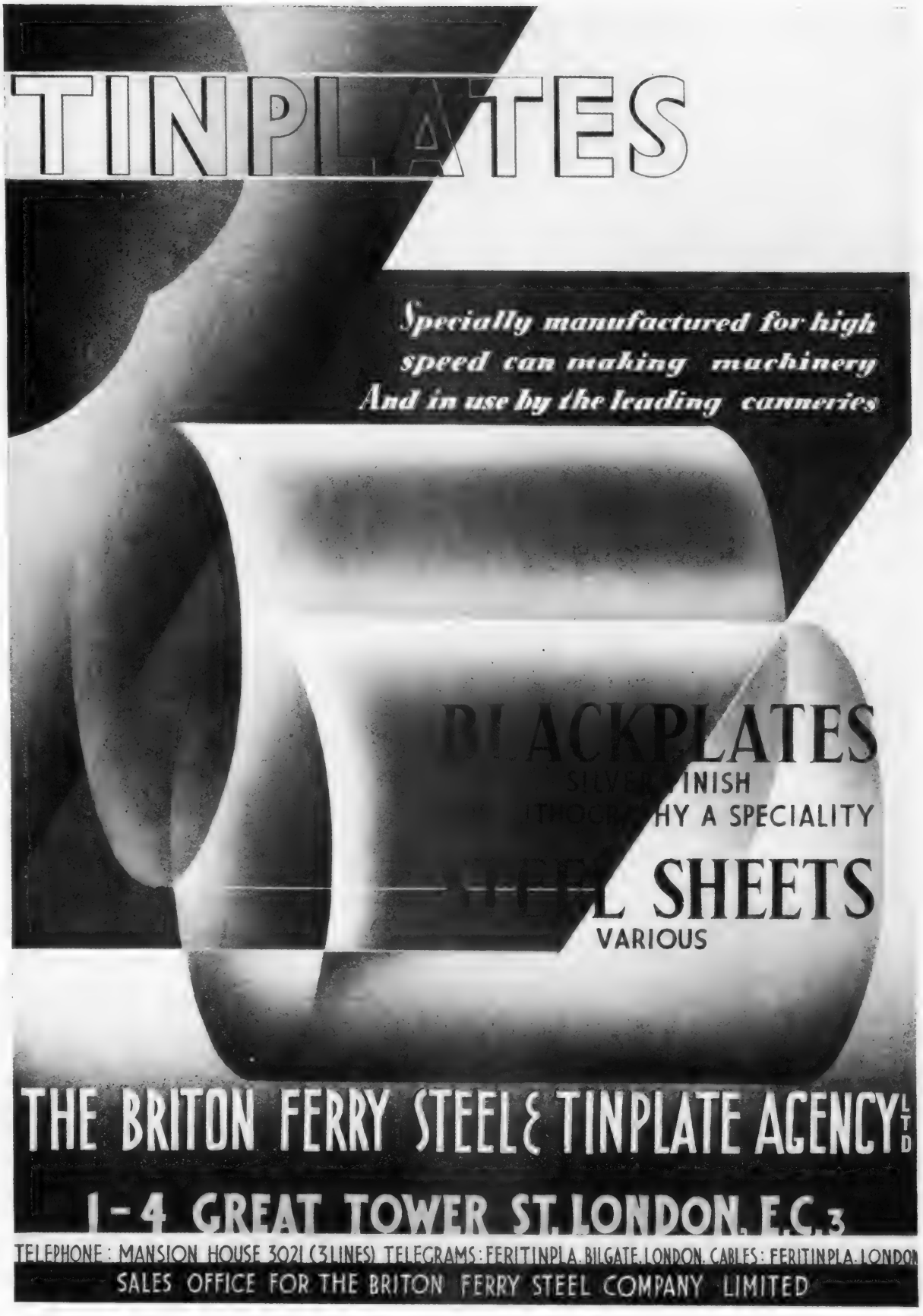
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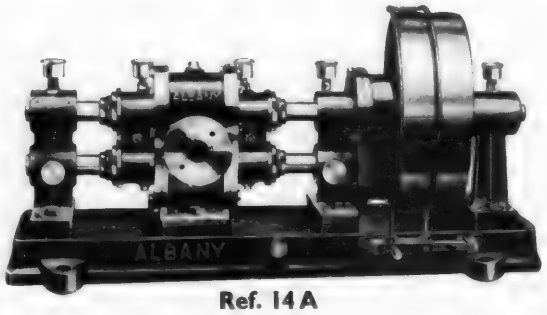

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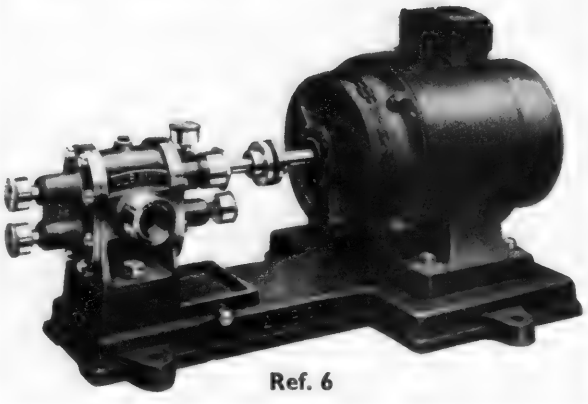

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Albany Pumps are supplied for Tank Wagons and mounted complete with power take-off from the engine.

Albany Pumps are made in suitable metals and designs to comply with the special requirements of all liquid foodstuffs.

Albany Pumps in Stainless Steel a speciality.

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ALL OTHER COLOURS FOR CANNED & BOTTLED FRUITS & VEGETABLES

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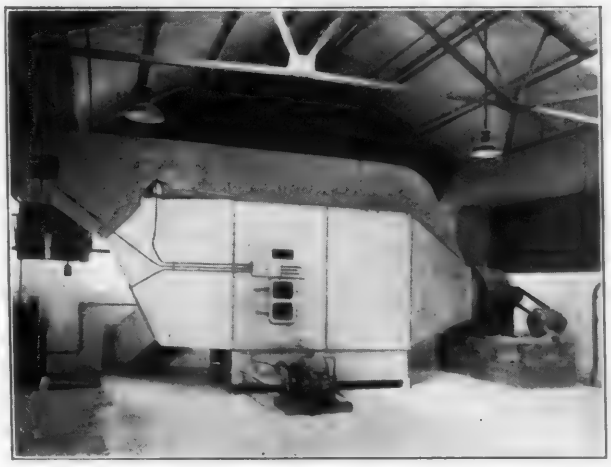
VENTILATING *and* AIR CONDITIONING



AIR CONDITIONING has become an essential feature of all modern factories. No longer a *luxury* but a *necessity*. Conditioned air ensures healthy atmosphere, prevents tiredness, keeps brain active, thus improving quality and quantity of Product.

Plant illustrated shows installation made in conjunction with large drying process. Operation of damper controls ensures correct conditioned air entering ovens.

Let us advise you.

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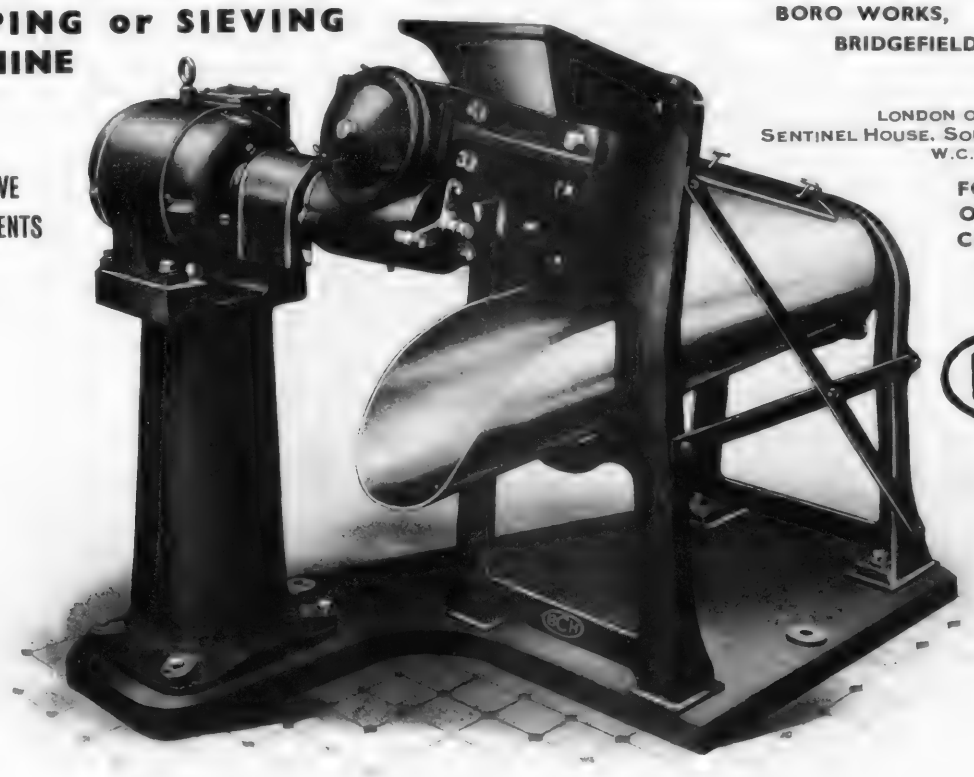

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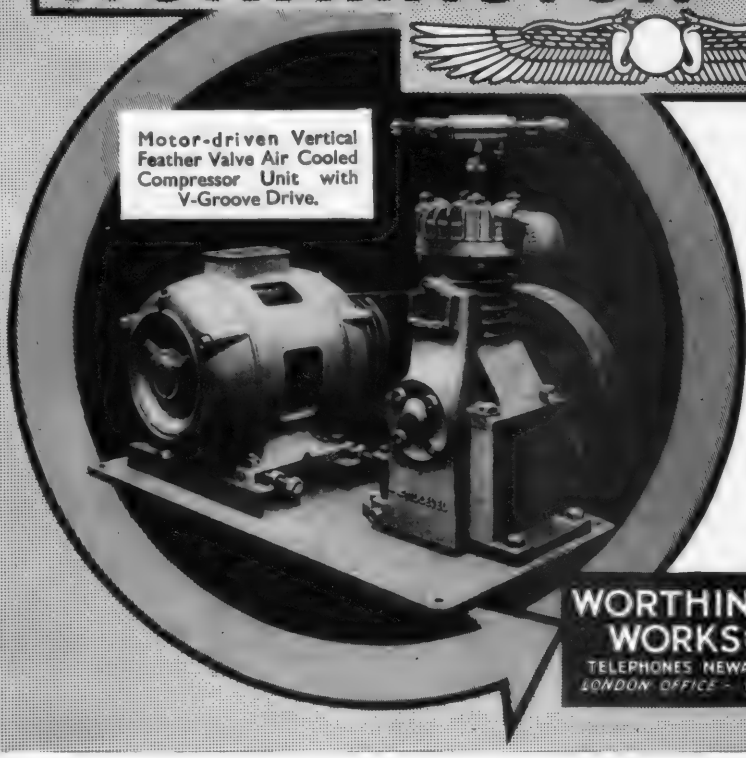

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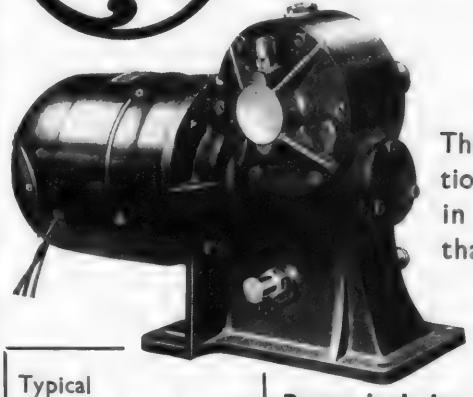

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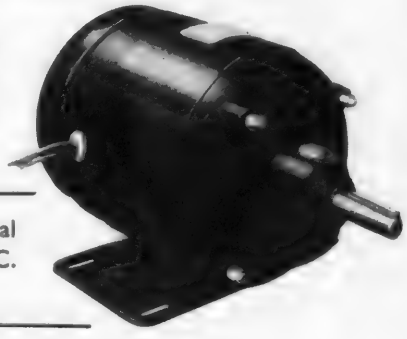

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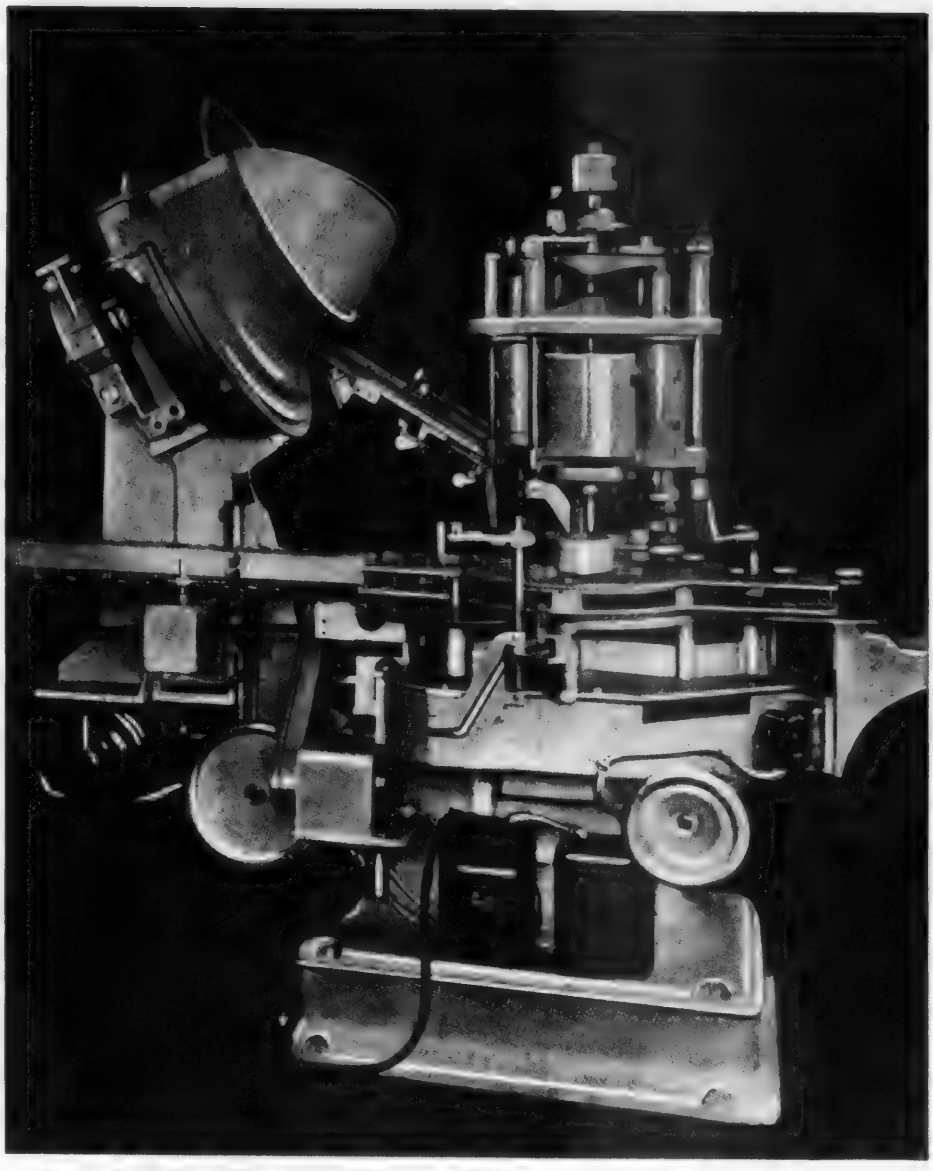

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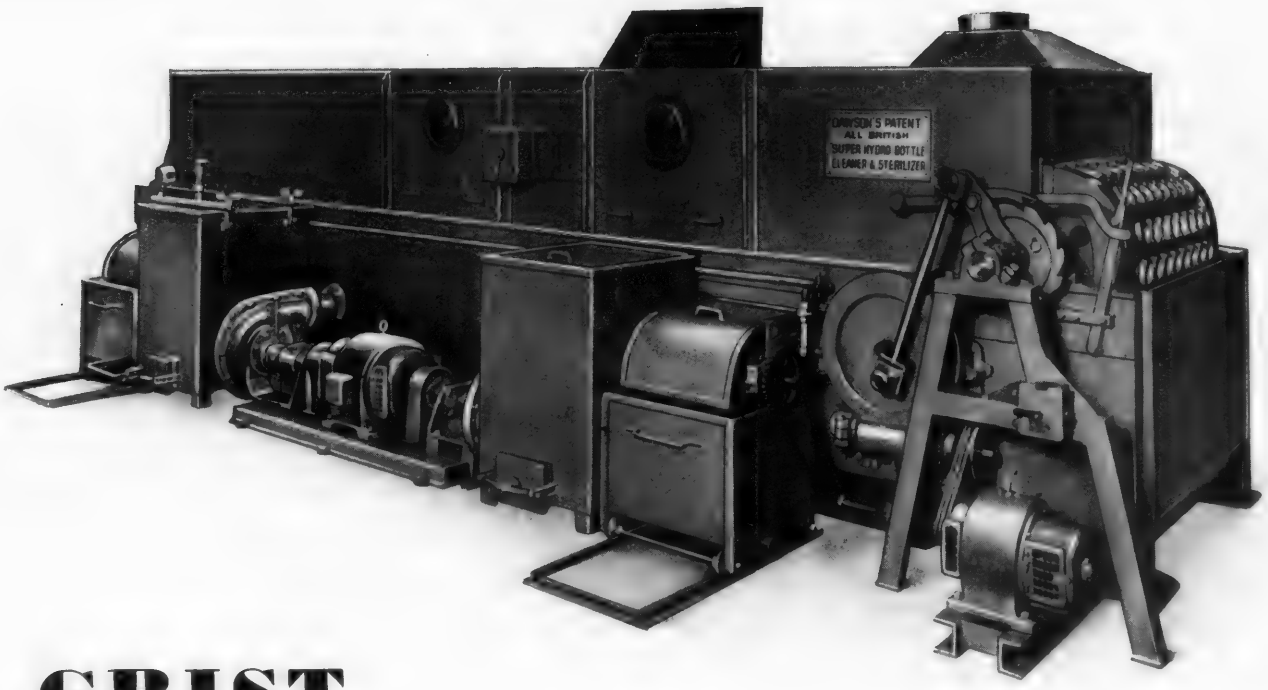

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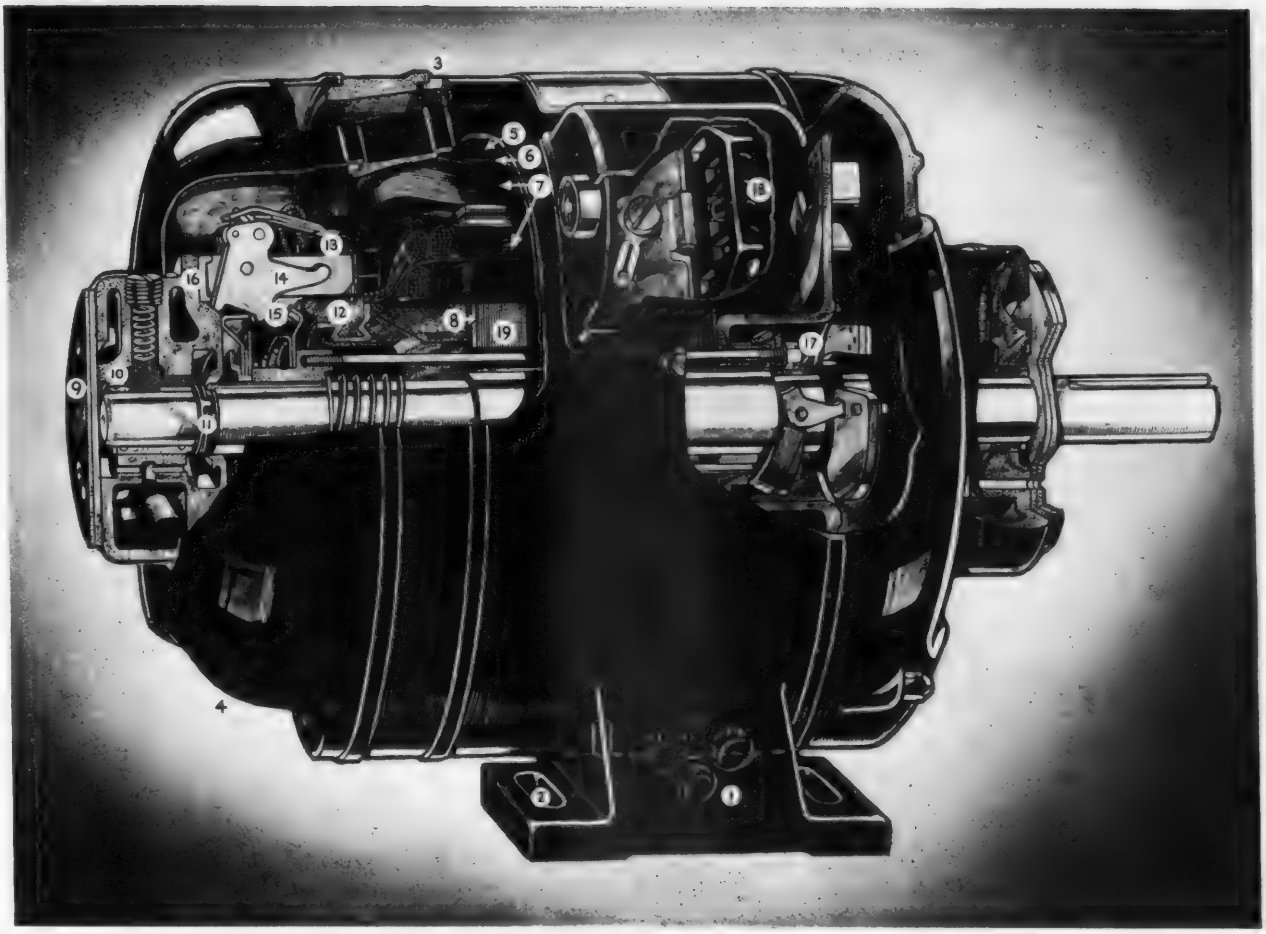

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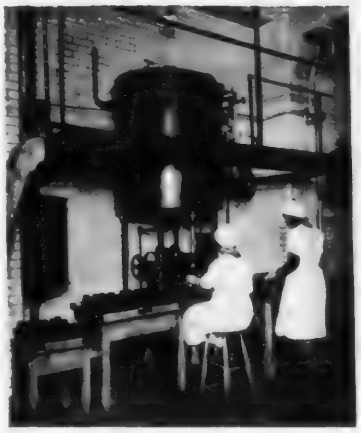

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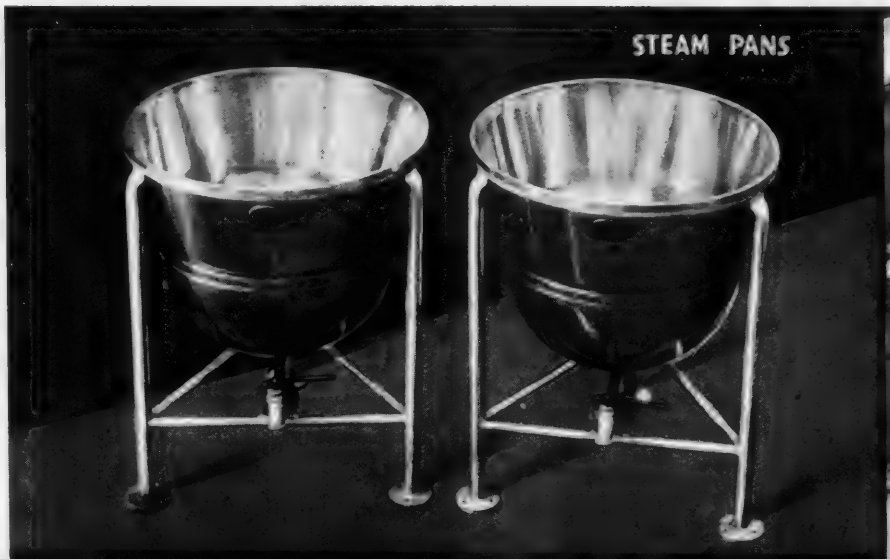

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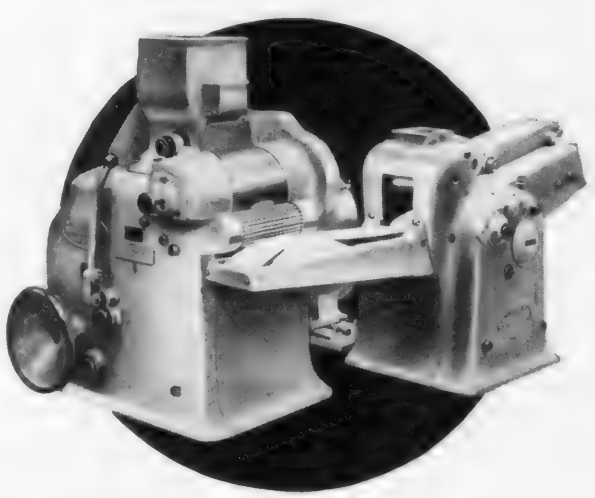

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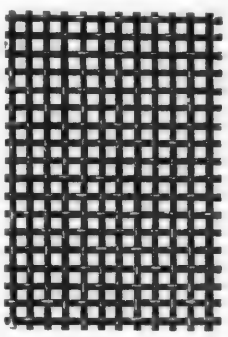

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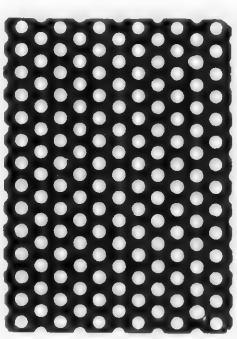

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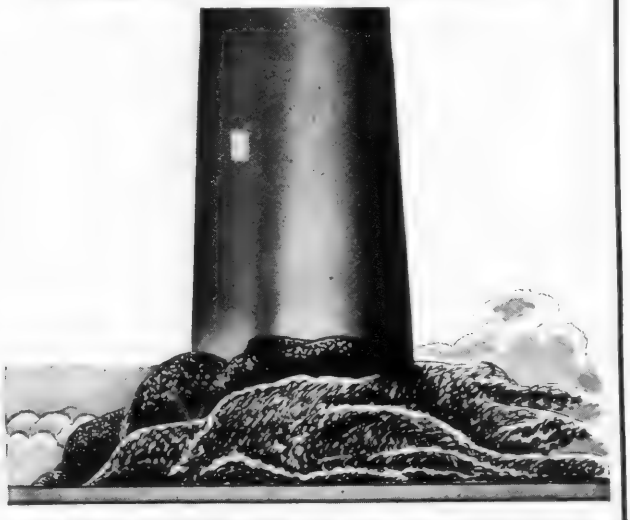

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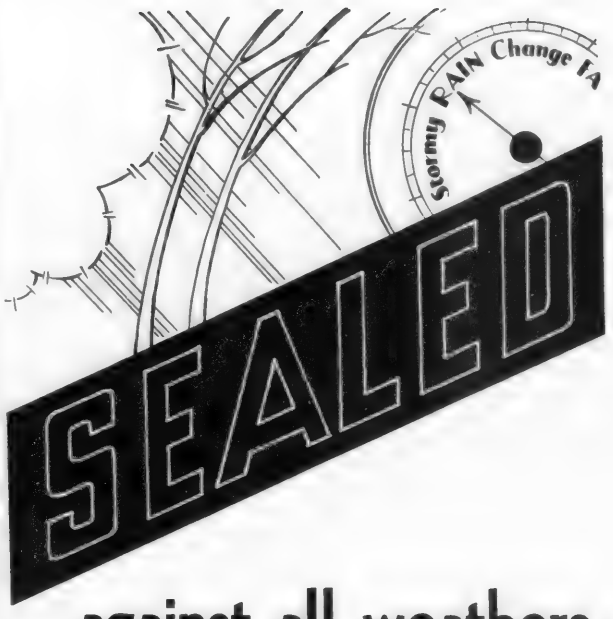

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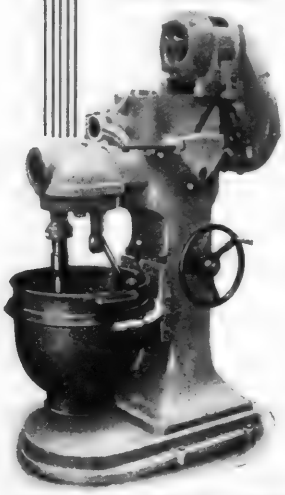

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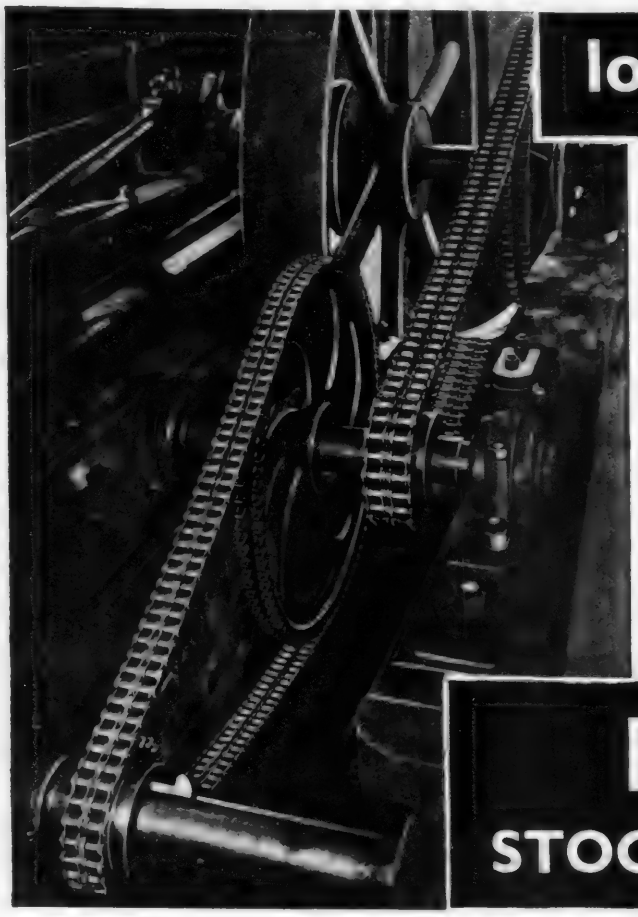

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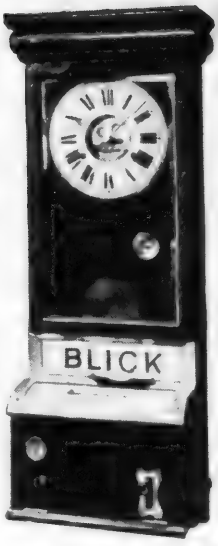

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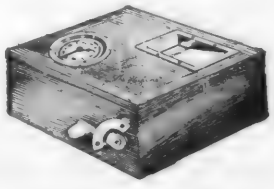

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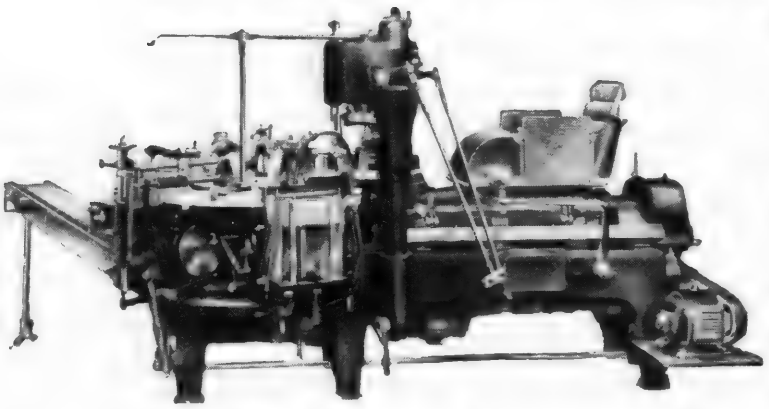

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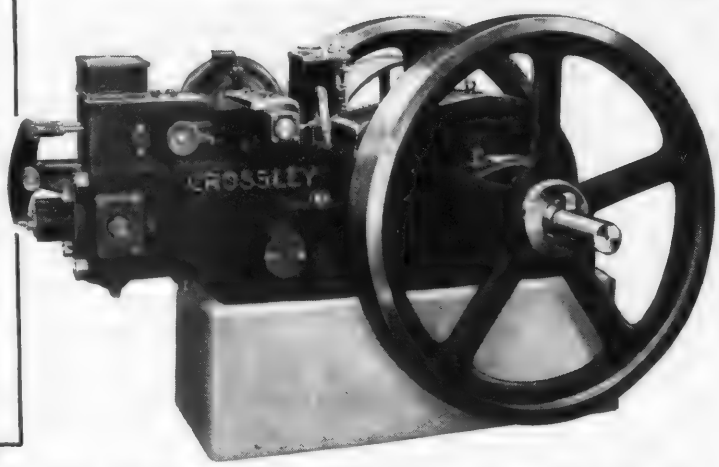

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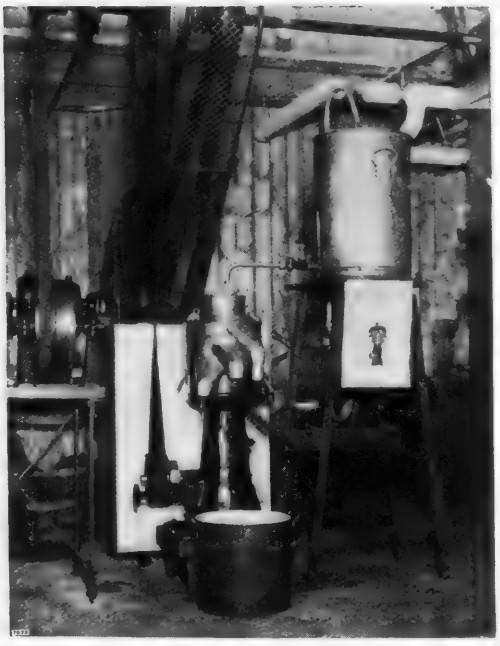

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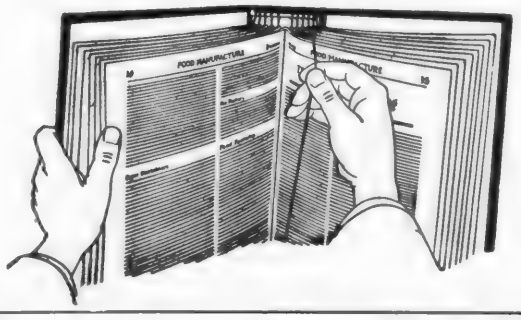

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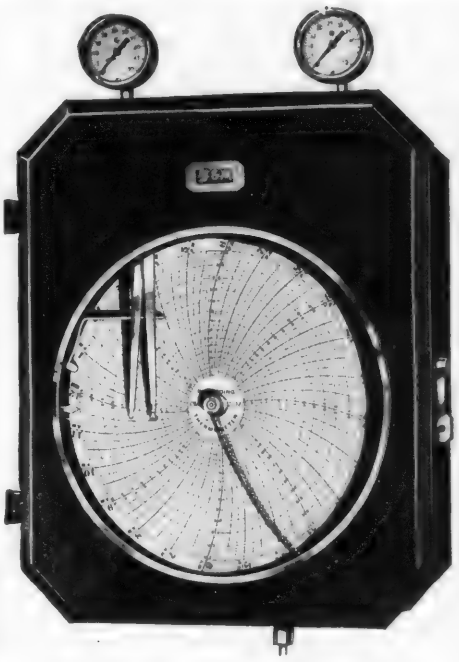

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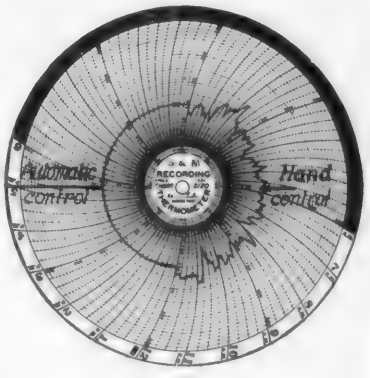

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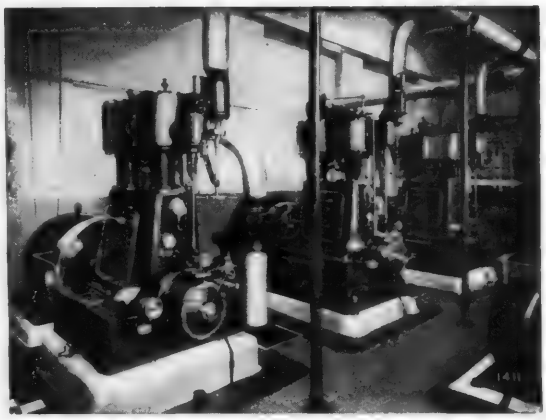

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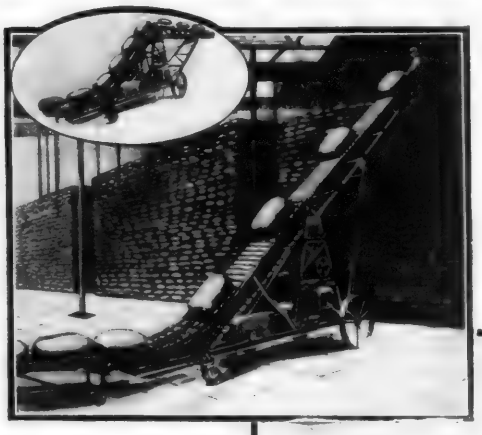

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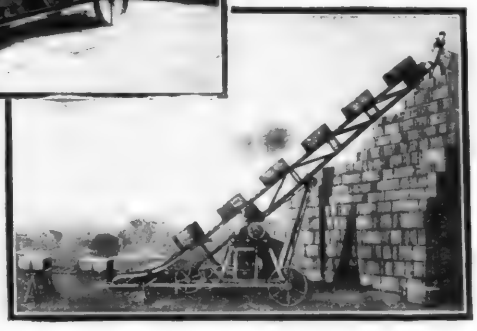

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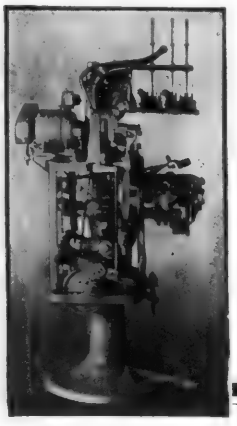

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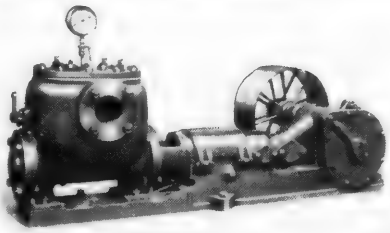

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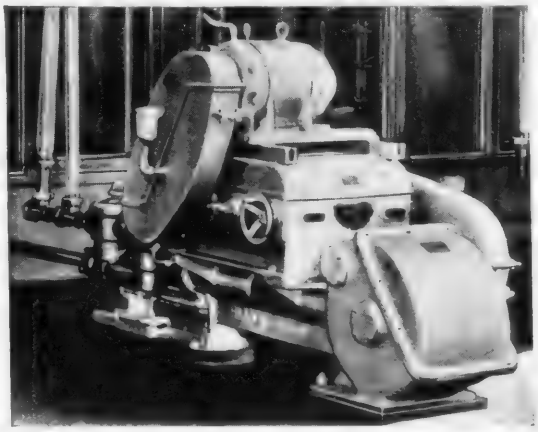

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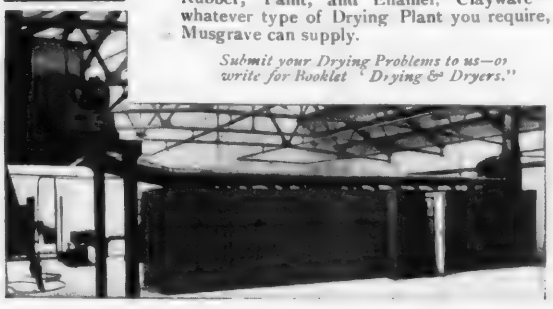

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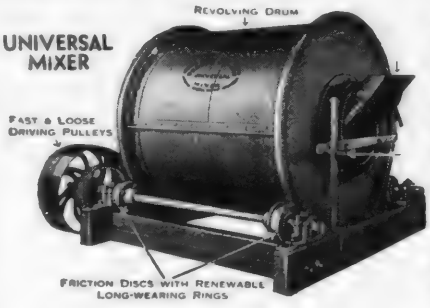

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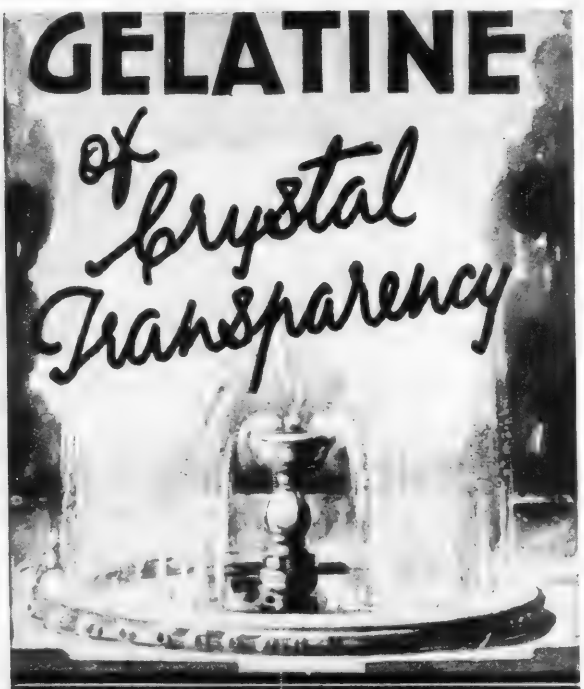

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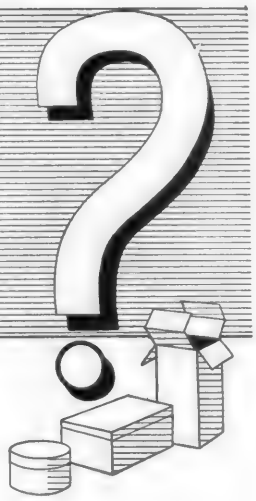

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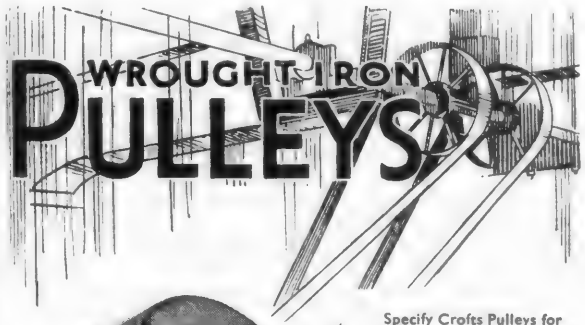

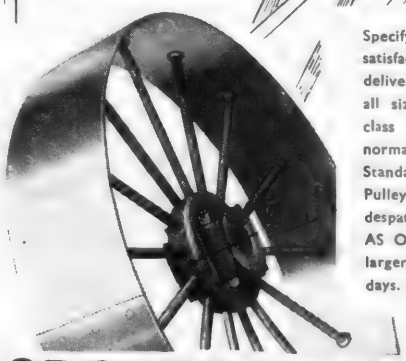

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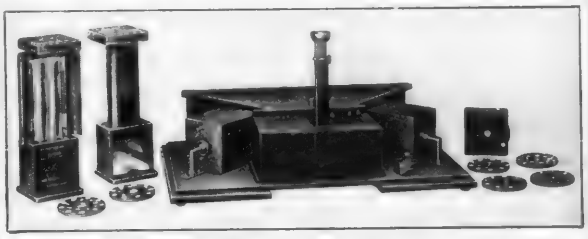

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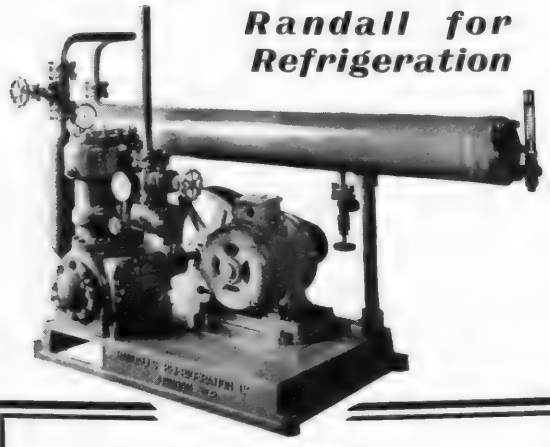

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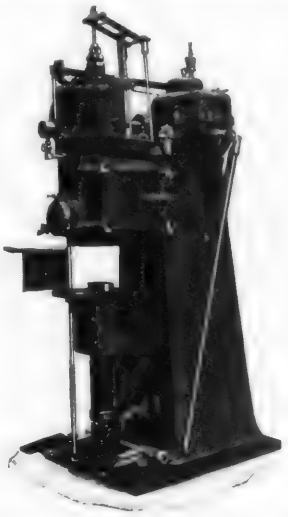

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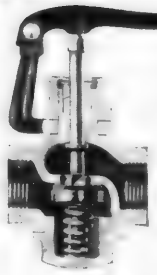

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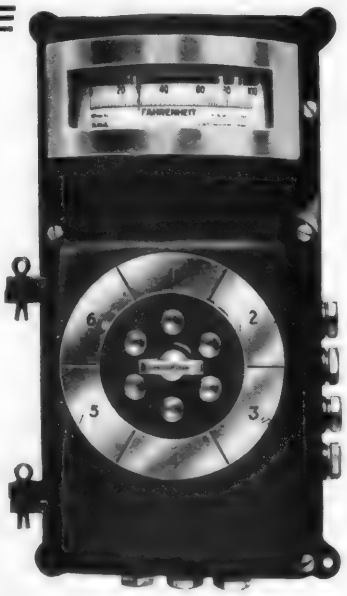

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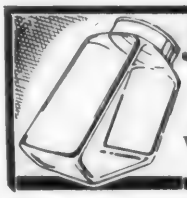

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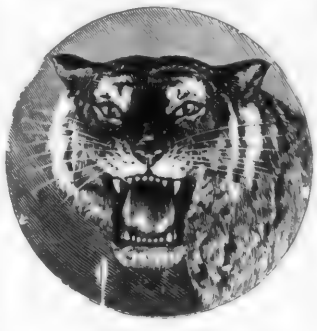

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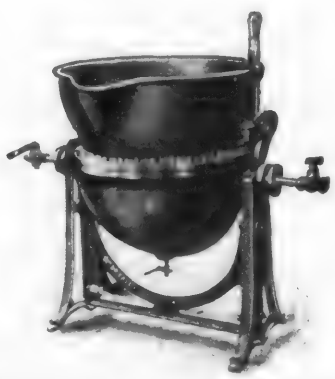

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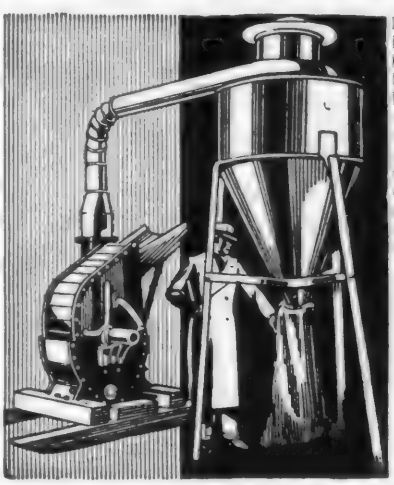

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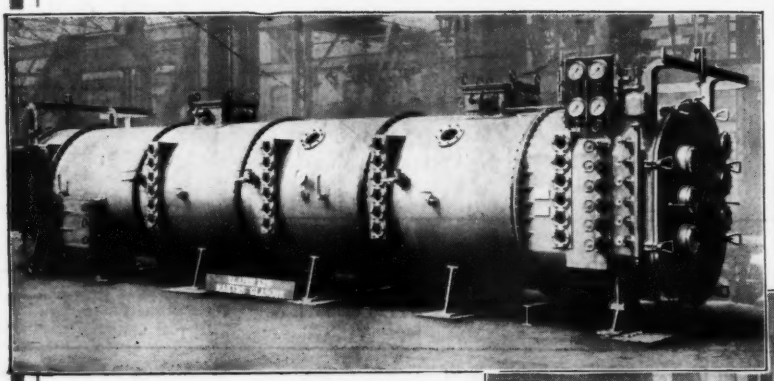

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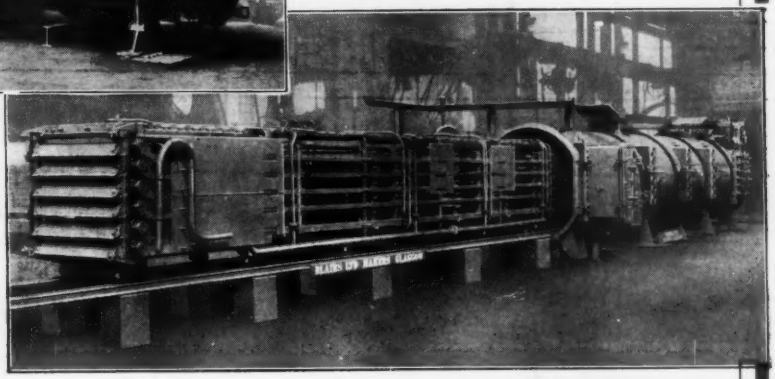

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